

# **A framework to assist organisations with information technology adoption governance**

by

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## **ABSTRACT**

The evidence from the literature suggests that Information Technology adoption (IT) governance in organisations is still a challenge. The diversity of application and the ever-increasing use of IT results in making decisions on IT adoption a major challenge for organisations. The decision about using a particular technology from an organisational perspective is problematic since individual users have different worldviews. The implicit assumption in IT adoption literature is that stakeholders always reach consensus during IT adoption decision making in organisations.

This study explored the existing models and frameworks in order to develop a preliminary improved IT adoption governance framework. This study used a case study sequential explanatory mixed methods research approach to validate the preliminary IT adoption governance framework. The first validation phase of the framework was done using a quantitative approach followed by the second validation phase based on qualitative interviews. The last validation was done after integrating the quantitative and qualitative results to produce the refined framework.

The results suggest that the developed framework may improve IT adoption governance in organisations. The results showed that the framework components facilitate IT adoption governance in organisations. The results also suggest that the components have an association with each other except for the Technology Acceptance Model component. The results indicate that stakeholder participation and hard systems thinking components have a strong predictive impact on IT governance framework component perception in organisations.

The study results suggest that IT adoption decision makers need to balance different stakeholders' demands during IT adoption decision making in organisations. The framework helps in that regard by reconciling different stakeholders' demands through collective IT adoption decision making. The strength of the framework is its integration of theories from various disciplines in understanding stakeholder expectations. On that basis the framework is in a better position to offer more insight into understanding challenges of IT adoption decision making than existing frameworks and models. The framework offers a potentially valuable basis

for future research in IT adoption decision making in organisations. The results suggest that the framework may facilitate IT adoption in organisations using different components.

**KEYWORDS**

IT Adoption, Systems Approach, Soft Systems Thinking, Hard Systems Thinking, Emancipatory Systems Thinking, Critical Systems Thinking, Mixed Methods, Pragmatism, Sociological Paradigm, Diffusion of Innovation, Systems Dynamics

## **DECLARATION**

I declare that this research entitled: A framework to assist organisations with information technology governance is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. I further declare that I have not previously submitted this work or part of it, for examination at UNISA or another qualification or any other higher education institution.

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SIGNATURE: OSDEN JOKONYA

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DATE

## **PUBLICATIONS**

The following publications emanated from this research

- Jokonya, O.; Kroeze, J. H. van der Poll, J. A. (2012), Towards a Framework for Decision making regarding IT Adoption, Proceedings of SAICSIT 2012, Pretoria, South Africa, ACM ISBN: 978-1-4503-1308-7, pp. 316-325
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- Jokonya, O.; Kroeze, J. H. and van der Poll, J. A ., (2014) A framework to assist organisations with information technology adoption governance, Proceedings of the Sixth IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2014) Changi, Singapore, 14-18 December 2014 (Accepted)

## **DEDICATION**

This thesis is dedicated to my father Mr. Sam Jokonya, my mother Mrs. Maud Shambare Jokonya, my wife Mavis, my children Alivin, Tinashe, Tania, and Tarryn.

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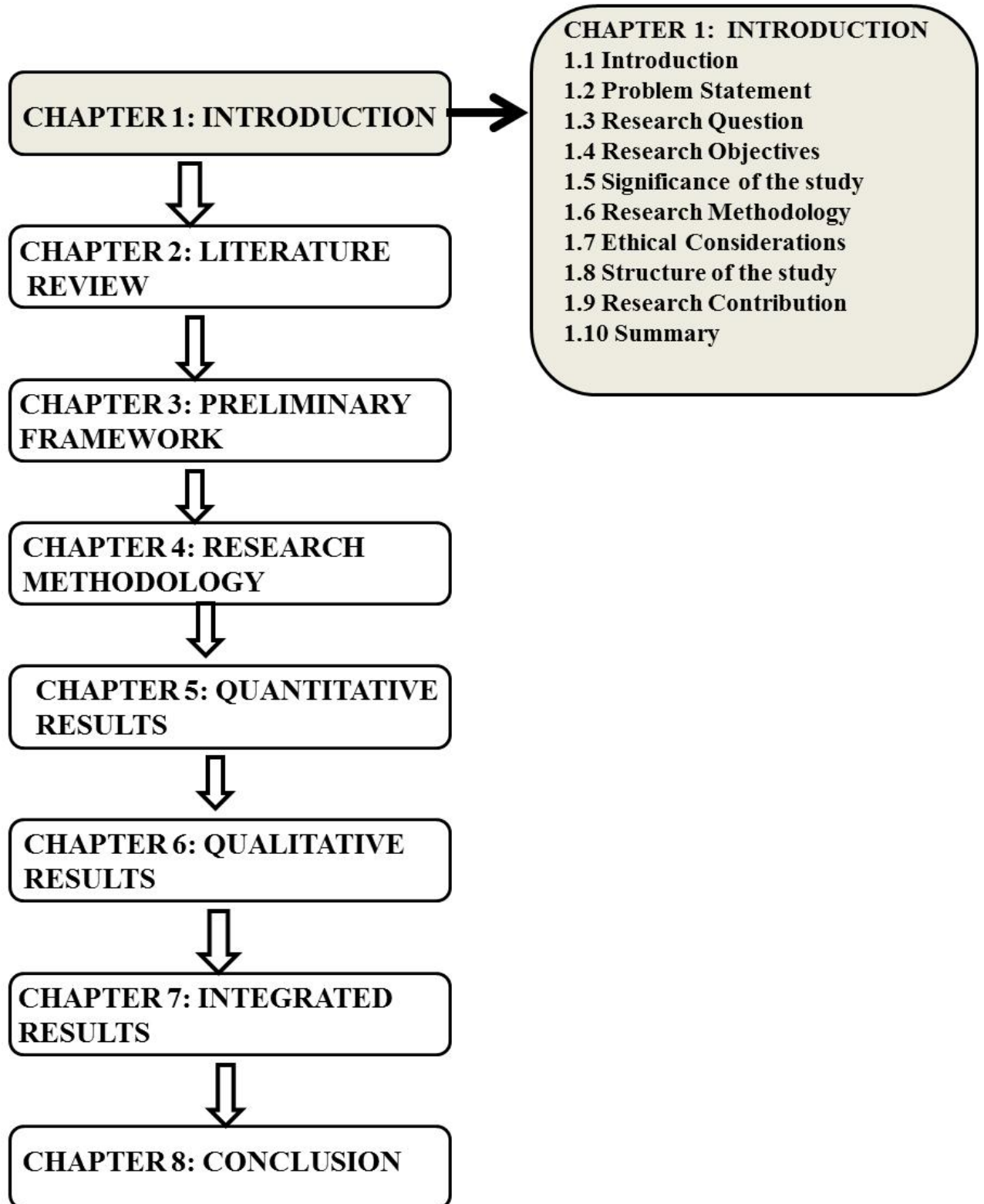
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## LIST OF ACRONYMS

ABBREVIATIONS	DESCRIPTION
ANOVA	Analysis of Variance
BEE	Black Economic Empowerment
COBIT	Control Objectives for Information and Related Technology
CSP	Critical Systems Practice
CSH	Critical Systems Heuristics
CSR	Corporate Social Responsibility
CST	Critical Systems Thinking
DOI	Diffusion of Innovation Theory
FMCG	Fast Consumer Moving Goods
EDI	Electronic Data Interchange
HEM	Human Environmental Model
IP	Interactive Planning
IS	Information Systems
ISACA	Information Systems Audit and Control Association
ISO	International Organization for Standardization
IT	Information Technology
ITIL	Information Technology Infrastructure Library
JIT	Just In Time
SAST	Strategic Assumption Surfacing and Testing
SD	Standard Deviation
SOSM	Systems of Systems Methodologies
SPSS	Statistical Software for Social Sciences
SSM	Soft Systems Methodology
TOE	Technology Organization Environment Theory
TSI	Total Systems Intervention
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
VSM	Viable Systems Model



## CHAPTER 1: DIAGRAMMATIC OVERVIEW



# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

Information Technology (IT) adoption refers to the way in which a decision to use technology is made, whereas diffusion refers to a decision to implement the technology after the IT adoption decision (Bouwman, Dijk, Hooff and Wijngaert, 2005). IT adoption decision making is understood to mean the way in which decisions are made on IT adoption for the benefit of the organisation. The way IT adoption decisions are made has an impact on IT adoption success in organisations (Mirza, 2010; Baker, 2012). The literature suggests that improving IT adoption decision making enhances IT adoption success in organisations (Mirza, 2010). In most cases, information technology is no longer only a support service but also part of the business, which determines the competitiveness of the organisation (Bouwman, et al., 2005; Lee, 2013). They add that IT has radically modified basis of competition in many organisations and continues to influence the competitive posture of business across the world.

The challenge for most organisations is the assumption that information technology benefits are self-evident after adopting the specific technology (Bouwman, et al., 2005; Baker, 2012). However, most studies have revealed that information technology in organisations does not always guarantee all the anticipated benefits from the investment (Brynjolfsson and Hitt, 1998; Bernroider, 2008; Turel & Bart, 2014). Many researchers have highlighted the importance of understanding the IT adoption decision making process in organisations (Shaw et al., 2002; Lawrence, 2010; Mirza, 2010). Despite many studies on IT adoption in organisations (Rogers, 2003), understanding how decisions are made on IT adoption is still a challenging issue to many researchers (Venkatesh et al., 2006; Bagozzi, 2007; Oliveira & Martins, 2011). The main shortcoming of the existing models and frameworks is that their main concern is on individual users at the expense of the whole organisation where stakeholders have different worldviews. The little attention paid on organisations by the existing models and frameworks has prompted much research on IT adoption decision making in organisations in recent years.

The evidence from literature suggests it is still a challenge to many organisations to achieve sustainable benefits from IT adoption (Bouwman et al., 2005; Kurkinen, 2013). The existing challenges therefore call for improved IT adoption decision making to reduce adoption

failures in organisations. Many researchers have challenged the use of traditional approaches in dealing with complex IT adoption problem situations facing modern organisations (Lyytinen & Newman, 2008; Cordoba, 2009; Kurkinen, 2013). The failure of IT adoption in organisations has been attributed to inadequate exploring of stakeholder requirements, as decisions are made away from those affected by the intervention (Verner and Cerpa, 2005; Freeman, 2011). The shortcoming of the traditional approaches is the use of simple solutions (linear approach) to often complex unpredictable IT adoption decision making in organisations (Lyytinen & Newman, 2008; Weilbach & Byrne, 2010).

IT adoption decision making in organisations is too complex to be predicted in a linear form because of the interactive nature of the elements of the systems (Cilliers 1998; Jackson, 2010). The complexity of IT adoption decision making means it needs to work with different paradigms to offer multiple insights to the complex phenomenon (Peterson, 2004). The systems approach acknowledges the complexity and dynamic nature of IT adoption in organisations (Cordoba, 2009; Jackson, 2010). Calder (2005) posits that there is no one-size-fits-all IT adoption governance solution to IT adoption in organisations, hence the need to work with different paradigms to address complex IT adoption problem situations. Many researchers concur that existing models and frameworks fail to understand the complexity of IT adoption in modern organisations as they pay much attention to a reductionist approach based on effectiveness and efficiency (Bernroider, 2008; Kurkinen, 2013; Cordoba, 2009).

The challenge of a simple solution-based reductionist approach is the failure to appreciate the context of IT adoption in organisations where stakeholders may have different worldviews (Jokonya & Hardman 2011). The increase in the number of studies on IT adoption decision making in organisations has shown that IT adoption has become a prime concern for both practitioners and researchers in recent years (Venkatesh et al., 2003; Gallivian, et al., 2005; Buenaflor & Kim, 2013). However, despite several insights into factors influencing IT adoption decision making in organisations, many questions remain unanswered and unexplained in this complex social phenomenon, which is common in social sciences associated with difficult human behavior (Beltz & Kello, 2006; Buenaflor & Kim, 2013; Kurkinen, 2013).

This chapter is arranged as follows: section 1.2 presents the problem statement of the study, section 1.3 presents the main research question, section 1.4 presents the study objectives,

section 1.5 presents the significance of the study, section 1.6 presents the research methodology, section 1.7 presents the ethical considerations, section 1.8 presents the outline of the chapters, section 1.9 presents main study contributions, and section 1.10 presents the summary of the chapter.

## **1.2 Problem Statement**

Information technology adoption challenges facing organisations are too complex to be resolved using only one approach as there is no one-size-fits-all solution to problem situations. Most existing IT adoption models such as the Technology Acceptance Model (TAM) only consider individual behavior and views on technology adoption, without providing mechanisms to accommodate multiple stakeholder perspectives in an organisation (Benbasat & Barki, 2007; Lee, 2013). The existing frameworks are not sufficient to address the complex challenges of IT adoption decision making in organisations. Most IT adoption challenges in organisations are due to a failure of meeting end users' requirements (Magnusson et al., 2010; Bernroider, 2008). The findings from the above literature, although not exhaustive, suggest that IT adoption is still a major challenge to many organisations (Fung, 2013; Mekic and Ozlen, 2014; Baker, 2012; Yeboah-Boateng & Essandoh, 2014).

The major challenge is to improve IT adoption decision making in organisations to reduce adoption failures (Mirza, 2010). The diversity of stakeholder worldviews makes IT adoption decision making a challenge for many organisations (Bouwman et al., 2005; Baker, 2012). The implicit assumption in most frameworks is that there is always consensus in IT adoption decisions (Jackson, 2010). The decision of using a particular technology from an organisational perspective is problematic since individual users have different worldviews (Bouwman et al., 2005; Surrey, 2009). Many researchers have questioned the suitability of existing IT adoption frameworks and whether decisions on IT adoption are made in the interest of stakeholders or executives (Mirza, 2010; Kurkinen, 2013). The challenges in organisations are who makes decisions on IT adoption issues. Most failures of IT adoption in organisations have been attributed to poor IT adoption decision making. The discussion in the problem statement section points to the fact that there is no one-size-fits-all approach to IT adoption decision making in organisations due to the complex nature of the environments. The next section discusses the research objectives of the study.

### **1.3 Main Research Question**

To address issues highlighted in the problem statement the main question of the study is therefore:

- How can information technology adoption governance in organisations be facilitated?

The following sub-questions will help answer the main research question:

- What are the needs of a framework to assist organisations during information technology adoption?
- What are the possible shortcomings of existing frameworks during IT adoption in organisations?
- How can IT adoption frameworks be improved in order to assist organisations with IT adoption governance?
- To what extent could the new framework facilitate IT adoption governance in organisations?

### **1.4 Research Objectives**

The aim of this study is to develop an improved IT adoption governance framework to assist with IT adoption decision making in organisations. The main objectives of this study are:

- To determine the needs of an organisation during information technology adoption
- To explore and evaluate existing frameworks for assisting organisations with IIT adoption decision making
- To develop an improved IT adoption governance framework to assist organisations in IT adoption decision making.
- To validate and refine the developed IT adoption governance framework in organisations.

### **1.5 Significance of the study**

Despite increased investment in IT, studies show that sustainable benefit from IT adoption is still a major challenge to many organisations (Bernroider, 2008; Aharony, 2013). In literature there are still some knowledge gaps and disparities in thinking with regard to IT adoption in organisations (Weilbach & Byrne, 2010; Kurkinen, 2013). The success of an IT adoption process is to get benefits from IT investment, and adoption failure may lead to lack of trust of the IT department by end users and management in the organisation (Al-Hadeiri, 2013;

Bernroider & Schmollerl, 2013). Despite the importance of understanding IT adoption theories and strategies, there is a lack of thorough study on the research area.

Understanding and identifying some of the factors associated with IT adoption challenges in organisations are therefore important to improve intervention strategies (Marcolin et al., 2000; Lapointe and Rivard, 2005; Zafar, 2006; Al-Hadeiri, 2013). The challenges associated with IT adoption have been acknowledged by several studies. Myers (2009) urges Information Systems (IS) researchers to produce consumable practitioner research as part of their objectives. This study therefore answers that call for consumable research for practitioners. The failure of IT adoption in organisations has significant consequences for the IT department's reputation, which may be tainted making it difficult for it to be a trusted partner in the organisation. The research contributes to the existing body of knowledge on IT adoption decision making. The results from the study provide some understanding of the challenges of IT adoption decision making in organisations.

## **1.6 Research Methodology**

According to Creswell et al. (2011), the theoretical stance shapes and directs what type of theory to use in the study. The theory also provides a framework for the data collection phase of research. While worldviews operate at a broad perspective, theoretical foundations operate at a narrow perspective in research as a lens (stance) taken by the researcher to provide direction for different phases of the research (Creswell et al., 2011). Guba and Lincoln (2005) note that in research, philosophical assumptions guide the research inquiry at the broader level. The assumptions are the worldviews researchers bring to their enquiry in terms of how knowledge informs the study (Creswell et al., 2011).

### **1.6.1 Research Paradigms**

According to Morgan (2007) there are five types of paradigms, which are; positivist, post-positivist, constructivist, participatory and pragmatist. These four paradigms differ in their generality of worldviews and epistemologies. Positivist and post-positivist are more associated with the quantitative research approach, whereas constructivist are more associated with the qualitative research approach and the participatory paradigm is more influenced by political concerns and more associated with the qualitative approach (Creswell et al., 2011).

The pragmatism paradigm focuses on addressing the research problem rather than being restricted to one approach. In addressing the research problem with what works, pragmatism

is pluralistic and may combine different paradigms and methods (Creswell et al., 2011). The pragmatic approach was found suitable to understand participants' perception on IT adoption decision making in organisations as it accepts mixed methods research to address a single problem situation. As such, this study adopts the pragmatic approach to answer the research question: How can information technology adoption governance in organisations be facilitated?

### **1.6.2 Research Method**

This study used a sequential explanatory mixed methods design, which consists of two distinct integrated phases. The sequential explanatory mixed methods design is characterized by the collection and analysis of quantitative data before collecting and analyzing qualitative data in the second phase in sequence. The second qualitative phase of the study helps to explain or elaborate on quantitative results obtained in the first phase. The quantitative phase of the study helped to answer the “what” questions and qualitative helped to answer the “why” of participants' perceptions on IT adoption decision making in organisations.

### **1.6.3 Case Study Research**

This research uses a case study strategy whose strength is based on multiple data sources (triangulation) and depth (Yin, 1990). Oates (2009) concedes that a case study research strategy has been accepted in information systems research as it is suitable for understanding the relationship between technology and organisations. Yin (2011) contends that a case study research strategy is a well-tested and tried empirical research inquiry for studying information systems in organisations. The sequential explanatory mixed methods case study strategy has been found suitable for creating and validating theory in a single study from one or more cases (Yin, 2011).

## **1.7 Ethical Considerations**

The gatekeepers helped to get permission from executives to access the two organisations. Confidentiality of information and anonymity of the participants was assured by the researcher as data from interviews and questionnaires were stored at a lockable place and participant names were disguised. Before the interviews all participants had to sign a consent form acknowledging that their participation was voluntary. The ethical clearance certificate was obtained from University of South Africa before data collection could ensue.

## **1.8 Structure of the study**

**Chapter 1: *Introduction*:** This chapter briefly introduces the study and its objectives. The chapter also provides the problem statement, justification of the study and a brief research methodology. In addition the chapter provides an outline of the research in terms of chapters to follow.

**Chapter 2: *Literature Review*:** This chapter presents the literature on current IT adoption models and frameworks. The chapter also discusses the strengths and weaknesses of current models and frameworks relating to the complex phenomenon of IT adoption decisions in organisations. The chapter helps to identify the knowledge gap in the research area in relation to the proposed IT adoption governance framework to assist organisations with IT adoption decision making.

**Chapter 3: *The Preliminary Framework*:** This chapter proposes an IT adoption governance framework based on the literature reviewed from the previous chapter. The proposed IT adoption governance framework is developed from theories of existing frameworks highlighted in the literature review. The chapter also highlights the expected benefits of the proposed framework to IT adoption decision making in organisations as part of its contribution to the body of knowledge in the research area.

**Chapter 4: *Research Methodology*:** This chapter discusses the research methodology and philosophy. It also articulates the rationale for selecting the research methodology in terms of suitability to address the research question and objectives. The research strategy, data collection methods and data analysis are also discussed. The description of the organisations which participated in the case study is also presented. The objective of the discussion of the research methodology is to provide guidance with regard to validation of the preliminary framework before it is refined into the final framework. Finally, the chapter highlights the ethical considerations and the study limitations.

**Chapter 5: *Quantitative Results*:** This chapter presents the quantitative results of the first validation of the preliminary framework based on data from questionnaires. The chapter helped to design the questions for the second qualitative phase. The results are discussion as part of addressing the research question.

**Chapter 6: *Qualitative Results*:** This chapter presents the qualitative validation results from interviews with participants from the participating organisations. The qualitative validation



results are a follow-up to the quantitative validation results. The qualitative results therefore helped to understand the quantitative results from the first phase.

**Chapter 7: *Integrated results*:** This chapter presents the integrated results from the quantitative and qualitative results. The chapter discusses the integrated results as part of refining the developed framework in Chapter 3. The chapter discusses the final framework before final validation from the second qualitative interviews. Finally, the conclusion of the integrated results is presented.

**Chapter 8: *Conclusion*:** This chapter discusses how the study met the objectives and answered the research questions. The chapter also discusses the contribution of the study, makes recommendations based on the results, and discusses the limitations of the study and future research areas.

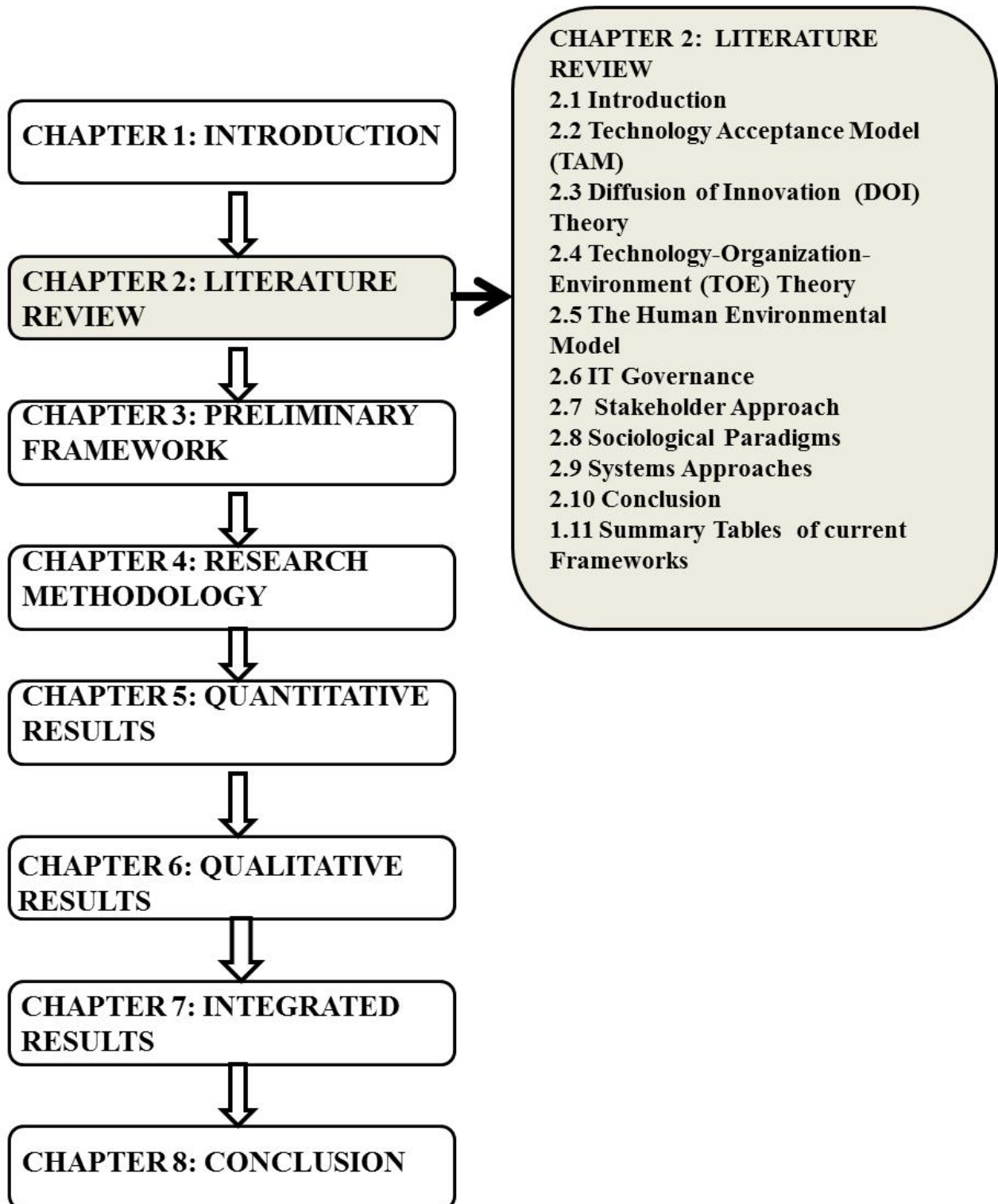
## **1.9 Main Contribution**

The main contribution of the study is the development and validation of an IT adoption governance framework to assist organisations with IT adoption decision making. In addition, the other contributions of the study include three presentations at international conferences and publications in the peer reviewed international conference proceedings.

## **1.10 Summary**

This chapter highlighted the challenges of IT adoption decision making from an organisation's perspective. While there is abundant literature on IT adoption from an individual perspective, there is not much literature from an organisation's perspective in which stakeholders have different worldviews. The chapter noted that the existing IT adoption frameworks may not be suitable for complex IT adoption decision making in organisations. The shortcomings of the existing IT adoption frameworks justified the need for an improved framework, which is the objective of this study. The chapter also justified the research methodology for validating the developed IT adoption governance framework to assist organisations with IT adoption decision making. The chapter also provided the research outline, and discussed the significance and contribution of the study in the research area. The next chapter reviews the existing literature on IT adoption in organisations.

## CHAPTER 2: DIAGRAMMATIC OVERVIEW



## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

The previous chapter introduced the research area, the research objectives, research question, and problem statement, contribution of the research and the structure of the study. This chapter reviews current literature on existing IT adoption frameworks. The importance of understanding the IT adoption decision making process in organisations has been highlighted by many researchers (Benbasat & Barki, 2007; Lawrence, 2010). Information Technology adoption at individual (for example, a personal mobile device) or organisational level (for example, an ERP system) is a highly researched topic in the IT field. Most literature on IT adoption in organisations is often premised on the assumption that IT investment benefits are always obvious after selecting the particular technology (Bouwman et al., 2005; Mirza, 2010). However, it has become sufficiently clear that the anticipated benefits from IT adoption in organisations are not self-evident as they may be elusive and difficult to achieve.

Despite several studies on IT adoption on factors influencing IT adoption decision making, challenges still persist (Martins, Moura, Cunha & Figueiredo, 2010; Mirza, 2010). This has prompted many researchers to question the suitability of existing models and frameworks for this complex phenomenon in IS research. The existing models and frameworks therefore seem to have limitations in addressing adoption problems faced by many organisations, for example, failing to understand how a framework may facilitate IT adoption decision making (Benbasat & Barki, 2007; Martins et al., 2010).

Bouwman et al. (2005) defined adoption as the decision making process of introducing a new technology in the organisation. IT adoption governance is defined as the process that describes how the decision of accepting or rejecting new technology from an individual or organisational context is made. IT adoption governance in an organisation context helps to reconcile different stakeholder demands during the process of decision making regarding the acceptance of IT. The IT adoption decision making process results in a decision about whether or not to implement the new technology. IT adoption takes places at micro (individual), meso (organisational) and macro (societal) levels (Bouwman et al., 2005).

The challenge of IT adoption in organisations is how to understand its effects at the three different levels. Individual user and organisation effects of technology adoption can never be fully understood because of its complicity and uncertainty. Bouwman et al. (2005) add that

technology adoption in an organisation is a two stage process, which involves the organisation and the individual user who decides to use the new technology. The first stage involves the decision by the organisation executives to embrace a new technology (Rogers; 200; Bouwman et al., 2005). The second stage involves the individual users in the organisation accepting and using the new technology. The adoption of new technology in an organisation is therefore a two stage process where the organisation makes the decision on a strategic level before the individual users make their own technology adoption decision on an operational level.

Rogers (2003) highlighted that individual decision depends on the organisational decision to a large extent. Bouwman et al. (2005) assert that it is therefore difficult to separate the organisational decision making from the individual decision whether or not to adopt the new technology. The technology adoption in an organisation can be either authoritative (where decisions are made by a few top executives) or collective (where decisions are supported by the members of the social system (Bouwman et al., 2005; Cordoba, 2009). The two types of adoption decision making, authoritative and collective, are suitable for different organisational contexts. Authoritative decision making has been found more suitable for bureaucratic organisations, and collective decision making is more suitable for professional adhocracy organisations (Bouwman et al., 2005; Cordoba, 2009).

The size, structure and culture of the organisation are important in determining the suitable type of IT adoption decision making process (Bouwman et al., 2005; Baker, 2012). Bouwman et al. (2005) challenge the belief in the existence of a rational decision making process during IT adoption in an organisation. The higher level of subjectivity, uncertainty and complexity of the decision making makes rational decision making difficult in an organisation (Jackson, 2010). This study focuses on technology adoption in organisations, which also involves an individual's adoption decision.

This chapter is arranged as follows: section 2.2 discusses the Technology Acceptance Model, section 2.3 discusses the Diffusion of Innovation Theory, section 2.4 discusses the Technology-Organisation Environment theory, section 2.5 discusses the Human Environmental Model, section 2.6 discusses the IT Governance framework, section 2.7 discusses the stakeholder approach, section 2.8 discusses the sociological paradigms and finally Section 2.9 discusses the systems approaches and finally section 2.10 the chapter conclusion.

## 2.2 Technology Acceptance Model (TAM)

The previous section introduced the literature with regard to IT adoption decision making in organisations. This section presents the Technology Acceptance Model (TAM) which is one of the most popular models for technology adoption from an individual user perspective. The TAM model by Davis (1989) is a popular and widely used model to predict individual user acceptance of new technology. The TAM model's assumption is that the individual adoption of technology is influenced by the two factors (perceived usefulness and perceived ease of use) of the new technology. The perceived usefulness refers to how the new technology enhances the user performance on the current work (Davis, 1989). The perceived ease of use refers to the effortlessness of the user working with the new technology (Davis, 1989).

The individual decision to adopt and use technology is of paramount importance to the information systems field (Sternad & Bobek, 2012; Aharony, 2013; Al-Hadeiri, 2013; Priyanka & Kumar, 2013; Musarrat, Loch & Williams, 2013). The current Technology Acceptance Model (TAM) by Davis (1989) shown in Figure 2.1 and its variations (e.g. UTAUT) are based on adaptations of the theories of reasoned action and planned behaviour to examine individual adoption of information technologies. The TAM's perceived usefulness and ease of use have been found important in individual adoption decision making (Benbasat and Barki, 2007; Kurkinen, 2013; Lee, 2013; Jaradat & Smad, 2013). The TAM's two constructs (perceived usefulness and perceived ease to use) have been found relevant to capture IT usage contexts (Benbasat and Barki, 2007; Abu-Shanab, 2013; Abu-Nahleh, 2013; Fung, 2013).

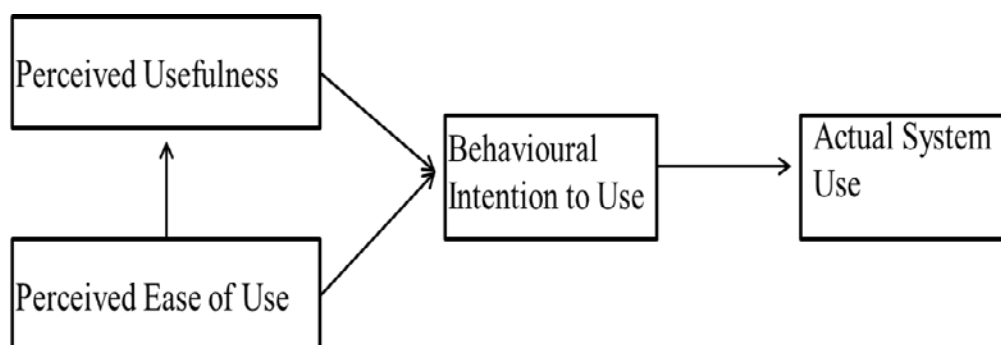


Figure 2.1: Technology Acceptance Model (Source: Davis, 1989)

Several studies (Schepers & Wetzels, 2007; Buenaflor & Kim, 2013) conducted support the model in predicting the individual user acceptance of new technology. Several extended variations of TAM (TAM2, UTAM, and UTAUT) have added other external variables and factors to the original model. The TAM2 extended model includes other factors such as social influence, cognitive instrumental process, voluntariness and experience. The UTAUT (Unified Theory of Acceptance and Use of Technology) by Venkatesh, Morris, Davis and Davis (2003) added variables such as age gender, experience and voluntariness.

Despite the use of the Technology Acceptance Model by Davis (1989) and its extended models (UTAM) which provide insights into individual user behaviour on technology acceptance, TAM lacks a mechanism for considering the perspectives of multiple stakeholders and their involvement in IT adoption decision making in organisations (Lawrence, 2010; Dimitrovski, Ketikidis, Lazuras & Balh, 2013). The inability of TAM to address diverse perceptions of stakeholders and expectations is detrimental to IT adoption success in organisations (Benbasat & Barki, 2007). TAM models are deterministic in nature because they fail to recognize the importance of different stakeholder worldviews, which is part of IT adoption and the use of technology in organisations (Lawrence, 2010; Oliveira & Martins, 2011).

The TAM model is suitable for individual users rather than for an organisational environment with multiple stakeholders (Lawrence, 2010; Oliveira & Martins, 2011). Although TAM has been found, arguably, to be the most influential theory in IT adoption, it has been criticized for diverting the attention of researchers away from other important issues on IT adoption (Benbasat et al., 2007; Oliveira & Martins, 2011). Most TAM studies reiterate the importance of perceived usefulness without investing much effort in trying to investigate what makes a system useful (Benbasat et al., 2007; Oliveira & Martins, 2011). Some researchers have criticized TAM's dominance as a paradigm for creating a narrow slice of the IT adoption domain (Benbasat et al., 2007). The perceived usefulness of a TAM construct is also subjective from an organisational context, since individuals have different perceptions of the utility of technology.

The application of TAM to new technology is not clear about which features are perceived as being useful or not, in order to improve the design (Benbasat et al., 2007). There is a need for more IT adoption theories suitable for the complex IT contexts to provide researchers with creative tools for IT adoption in organisations (Benbasat et al., 2007; Schepers & Wetzels,

2007; Luthfihadi & Dhewanto, 2013). While TAM is useful, the model needs to be integrated with other variables related to human and social change processes in IT adoption (Kim, Shin & Lee, 2009, Makori, Musoke & Maiga, 2014; Mekic & Ozlen, 2014; Moshki, Teimouri & Ansari, 2013).

Many researchers have investigated other factors, such as the effects of the potential adopter's gender, age, prior experience with technology, and the degree to which adoption is voluntary, to name a few (Venkatesh et al., 2006; Bagozzi, 2007; Oliveira & Martins, 2011). Although TAM has been found to be the most influential theory in IT adoption it has resulted in the unintended consequence of diversion of attention away from other important adoption issues (Benbasat et al., 2007; Sun, Wang, Guo & Peng, 2013; Yeboah-Boateng & Essandoh, 2014). Most TAM research has been criticized for ignoring IT artifact design and other important IT adoption consequences (Benbasat et al., 2007; Aziz & Jamali, 2013; Buenaflor & Kim, 2013; Adedaja & Morakinyo, 2013; Chakrabortya & Mansorb, 2013).

Benbasat et al. (2007) point out that the shortcomings of TAM are its lack of a systemic way to expand and adapt its core model based on the constant evolution of IT in organisations. The other important shortcoming of TAM has been its simplistic view of a system based on the predictive nature of cause-effect relationships of a deterministic approach (DeLone and McLean, 2003; Hou et al., 2013; Behrenbruch et al., 2013; Hidayanto et al., 2014). The TAM's over emphasis on usage as the dependent variable prevents researchers from investigating other important user behaviours. The shortcomings of TAM are due to the constantly changing context of IT organisations making it less relevant (Benbasat et al., 2007; Bagozzi, 2007; Phichitchaisopa & Naenna, 2013; Shah, Bhatti et al., 2013).

In summary, the literature has shown that while TAM has been popular and successful from an individual perspective, it has challenges at organisational level where stakeholders have different perspectives in terms of usefulness and ease of use constructs. Its deterministic approach based on a cause and effect relationship makes it less relevant to a socio-complex organisational environment where stakeholder perception is subjective. The shortcoming justifies the need for an integrated framework with many variables to alleviate the TAM's weaknesses. The next section discusses the Diffusion of Innovation Theory with regard to IT adoption decision making in organisations.

### **2.3 Diffusion of Innovation (DOI) Theory**

The previous section discussed TAM with regard to IT adoption decision making from an organisation perspective. The Diffusion of Innovation Theory, shown in Figure 2.2, by Rogers, (1995) is one of the most popular models for understanding IT adoption decision making in organisations, based on its five stages (Akabogu, 2013; Makowsky et al., 2013; Mustafa & Mothana, 2013). The Diffusion of Innovation (DOI) Theory is defined as the way in which an innovation is communicated through certain channels over time among members of a social system (Bouwman et al., 2005). DOI theory has been used as a useful lens to understand the uptake of new technologies in different contexts. Rogers (2003) mentions four important components that influence the perception of adopters of the new technologies, which are innovation, communication channels, time and the social system. In addition to the components there are five technology characteristics (compatibility, relative advantage, complexity, trialability and observability) which have an influence in the adoption of new technology.

The DOI theory is important in understanding the spread of new technology in society from individual and organisational perspectives (Oliveira & Martins, 2011). The DOI theory has been credited with explaining how new technology ideas spread through communities based on five attributes of innovation. The DOI theory's five characteristics of rate of adoption are important for understanding IT adoption in organisations. The basic tenet of the theory is that innovations are communicated through channels over time within a social system like an organisation. Rogers (2003) notes that at the organisational level of innovation the process is complex as it involves a number of individuals in the process. He adds that at the organisational level innovation success depends on the leadership, structure and other external factors. The DOI theory is useful in understanding the individual and organisational context of innovation.

Despite diffusion of innovation theory's popularity its bias towards the technological component of the adoption process while ignoring other issues has been criticized by many researchers (Bose & Luo, 2011; Thomas, 2013; Alwahaishi & Snasel, 2013). The criticism of diffusion of innovation theory is that IT adoption in organisations goes beyond technical factors but also includes social, economic and political factors. The diffusion of innovation theory needs further expansion to include other important factors.



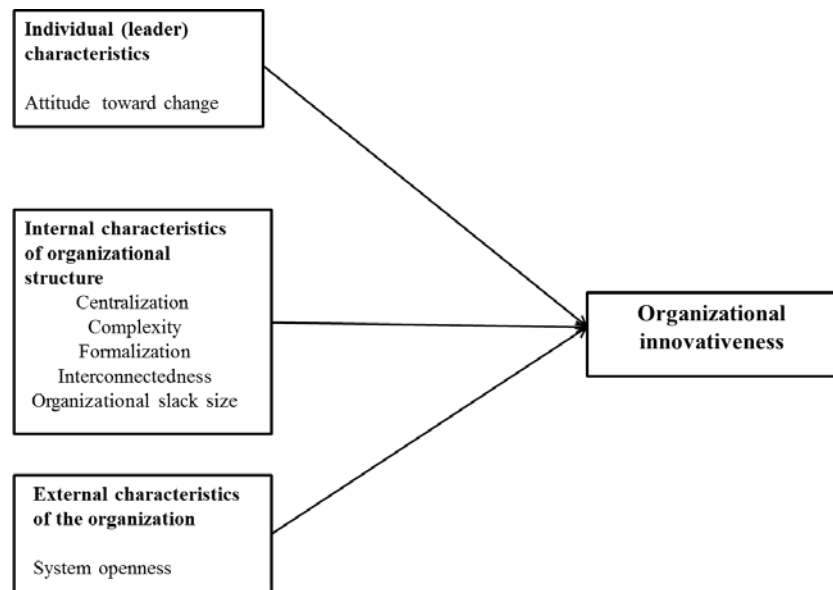


Figure 2.2: Diffusion of innovations (Source: Rogers, 1995)

Du Plooy (1998) criticizes the classic diffusion theory for ignoring the social context of IT adoption in organisations. The deterministic nature of classical diffusion is too simplistic for complex processes based on social interaction (Du Plooy, 1998; Baker, 2012). Du Plooy (1998) criticizes Roger's model for being too simplistic to address issues of a social nature in which IT adoption decision making takes place. The limitation of mechanistic causal relationships to socially construct IT adoption in organisations is the failure to understand the human environment and organisational context (Du Ploy, 1998; Baker, 2012). In order for IT adoption to be successful there is a need for social and environmental perspectives to complement technical perspectives (Weilbach et al., 2010).

IT adoption processes need to be based on social-technical adoption models instead of a technological linear phenomenon (Weilbach et al., 2010; Baker, 2012). As a conclusion, while DOI is an improvement from an organisation's perspective, it is still deterministic in nature and is more focused on the technology side ignoring the social context of IT adoption in organisations. There is therefore a need for an expanded framework that goes beyond the technical factors of IT adoption in organisations. The next section discuss the Technology-Organisation-Environment with regard to IT adoption decision making in organisations.

## 2.4 Technology-Organisation-Environment (TOE) Theory

The previous section discussed the Diffusion of Innovation (DOI) theory with regard to IT adoption decision making in organisations. The technology, organisation, and environment (TOE) framework (Figure 2.3) by Tornatsky and Fleischer (1990) on IT adoption in

organisations is influenced by three elements namely technology context, organisational context and environmental context (Bernroider & Schmollerl, 2013; Farahmand, 2013; Hsin-Pin, 2014; Luna-Reyes & Gil-Garcia, 2013). The TOE framework is more suitable for understanding IT adoption decision making from an organisation context. The framework is based on the fact that innovation decisions in organisations are dependent on factors associated with the three contexts (Oliveira & Martins, 2011).

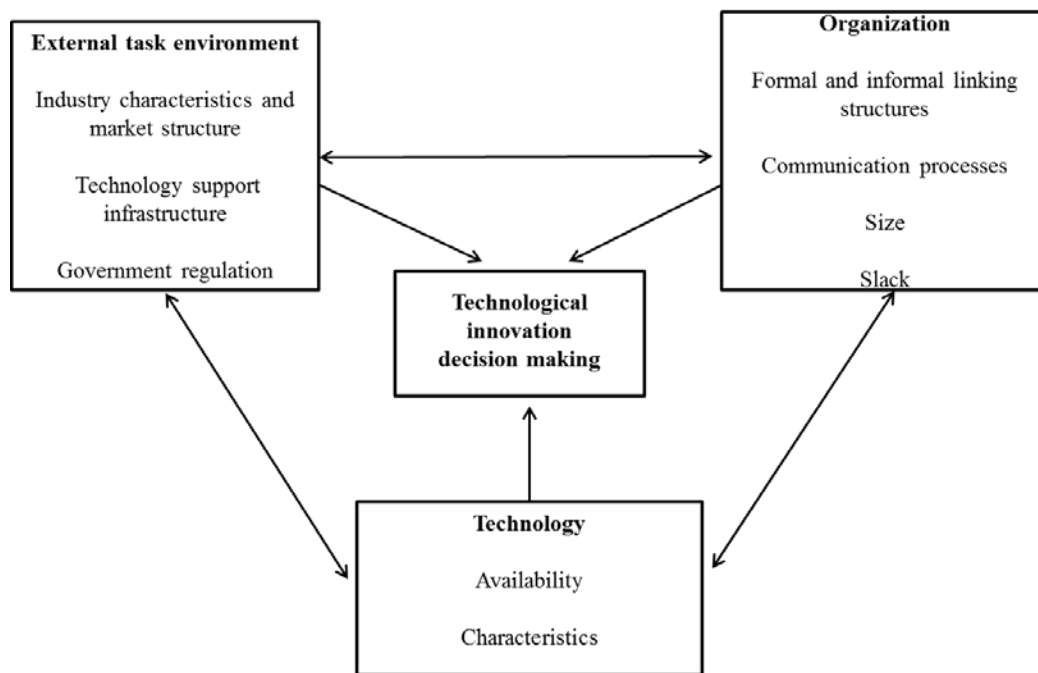


Figure 2.3: Technology, Organisation, and Environment framework (Source: Tornatzky and Fleischer 1990)

The technology context element's influence is based on the characteristics of technology available for adoption and the state of technology in the organisation, the nature of existing technology material and their use in the organisation. The organisational context element includes the size, structure, process, resources and behaviour of top management. The environment context element includes the existence of external support for the new technology, the government regulation and market structure. The interaction of the three elements with each other has an influence on IT adoption in organisations (Bose & Luo, 2011; Wang, Shu & Tu, 2008; Haag & Eckhardt, 2014; Akhtari et al, 2013).

Although the TOE theory has been successful in classifying adoption factors in their respective contexts it has been criticized for failing to provide a model for describing the factors that influence IT adoption decision making in organisations (Aziz & Jamal, 2013;

Yeboah-Boateng & Esaandoh, 2014). The technology-organisation-environment theory's main contribution has been to encourage researchers to broaden the context on IT adoption in organisations. In summary, the TOE framework is an improved framework which incorporates more factors from both organisational and environmental contexts in IT adoption decision making in organisations. The limitation of TOE framework is its lack of clarification of factors that influence IT adoption decision making in organisations. The next section discuss the Human Environmental Model with regard to IT adoption decision making in organisations.

## **2.5 The Human Environmental Model**

The previous section discussed the TOE framework with regard to IT adoption decision making in organisations. Du Plooy (1998) acknowledges the limitation of mechanistic causal relationships to social construct such as IT adoption in organisations, which are not predictable in nature. Du Plooy (1998) points out that IT adoption should be based on understanding the human environment and organisation context. The human environmental model for IT adoption provides a holistic framework with a broader perspective to address socio-technical issues associated with IT adoption decision making in organisations (Lyytinen et al., 2008; Weilbach & Byrne, 2010). Weilbach and Byrne contend that in many situations; IT adoption decisions are made by top management without involving stakeholders in the organisation. They concede that from an IT adoption perspective there is no voluntary adoption as it is always enforced from the top management.

Weilbach and Byrne (2010) note that politics has a major influence on IT adoption decision making in organisations. They contend that in order for IT adoption to be successful there is a need for a social and environmental perspective to complement the technical perspective. They point out that the human environmental model helps to achieve a more holistic approach to IT adoption in organisations. Holistic approaches to IT adoption need to be based on a social-technical adoption approach as opposed to a technological linear approach (Lyytinen et al., 2008; Weilbach & Byrne, 2010). They criticize most IT adoption models for being linear in nature and inadequate to deal with complex challenges of IT adoption in organisations.

Weilbach and Byrne (2010) add that most IT adoption models are too deterministic by assuming that stakeholders will automatically see the benefits of IT adoption in organisations in the same way. Most IT adoption models fail to appreciate the different worldviews of stakeholders in the organisations, which is the challenge of a top down approach to social

problems. They concede that for IT adoption to be successful the individual's worldview needs to be taken into account. They argue for the inclusion of political, cultural and power issues in IT adoption decision making. They highlight that IT adoption decision making is socially constructed with people having different worldviews on the same phenomenon. Since IT adoption decision making is socially constructed, the inclusion of social factors may lead to the success of IT adoption (Lyytinen et al., 2008; Weilbach & Byrne 2010).

Based on actor-network theory, IT adoption decision making should be treated as heterogeneous networks with people and organisations, which change to adopt to new environments (Weilbach & Byrne, 2010). The benefits associated with IT adoption need to be appreciated by stakeholders based on their worldviews. Weilbach and Byrne (2010) argue for a more contextual holistic approach on IT adoption policy, which takes cognizance of the complexity of the organisation's environment. Several authors have found that a multidisciplinary approach based on a user centered design improves IT adoption (Lyytinen et al., 2008; Surry, 2009). In summary, this section concedes that IT adoption decision making in organisations requires an interdisciplinary approach which addresses political, cultural and power matters associated with organisations. Several researchers concur that most existing deterministic models have limited application to the socio-complex phenomena of IT adoption decision making in organisations (Lyytinen et al., 2008; Surry, 2009).. The next section discusses the IT governance framework with regards to IT adoption decision making in organisations.

## **2.6 IT Governance**

The previous section discussed the Human Environmental Model with regard to IT adoption decision making in organisations. The pervasive nature of IT and the major dependency of business on IT make it difficult for executives to ignore IT governance in organisations (De Haes et al., 2008; Lee & Setiawan, 2013; Pereira, Almeida & Mira da Silva, 2014). The risks and benefits associated with IT adoption require it to be governed properly for organisations to reap the benefits (De Haes et al., 2008). Calder (2005) contends that there is no one-size-fits-all solution to IT adoption decision making in organisations.

A study by IT Governance (2011) notes that despite much literature on IT governance frameworks, IT problems still persist in many organisations. The study highlights that most of the challenges are to do with issues of people. Calder (2005) argues that adoption of IT in an organisation must critically examine relevance and validity of the organisation specific

context. Peterson (2004) states that stakeholder diversity interests are a major challenge to IT governance in organisations. He suggests the need for a decision framework that may help to alleviate IT adoption decision making problems in organisations. Most existing IT adoption models and frameworks have challenges in meeting stakeholders' needs in organisations (Holck et al., 2005; Offenbeek et al., 2013; Teo et al., 2013; Devos et al., 2012).

Goosen et al. (2013) define corporate governance as the relationships and structures that determine the business performance standards and direction. Researches on IT governance have shown some inconsistency and lack of consensus on its definition (Goosen et al., 2013; Pereira, Almeida & Mira da Silva, 2014). IT governance as part of corporate governance ensures the efficient and effective use of IT resources in organisations (Weill, 2004). IT governance helps to determine which decisions are to be made, and can contribute to the organisation objectives (Lorences et al., 2013). IT governance is responsible for supporting the effective and efficient use of IT assets to meet business objectives (Goosen et al., 2013). Some of IT governance definitions include:

- “the organisational structures, processes and mechanisms for decision making and management of IT assets in the organisation” (Teo et al., 2013).
- “[the] structure of relationships and processes to control the use of IT in the enterprise in order to achieve the enterprise’s goals by adding value while balancing risk versus return over IT and its processes” (IT Governance, 2011).

According to ITGI (2011), IT governance focuses on five main areas, which are, value delivery, strategic alignment, performance measure, risk management and resource management. Value delivery ensures that IT investments deliver benefits to the organisation. Strategic alignment ensures that IT investments support business objectives. Performance measure ensures that IT performance in the organisation is reported accurately and timeously based on measurable deliverables and matrices. Risk management ensures that IT related risks are regularly assessed and mitigated in the organisation. Resource management ensures that IT assets are effectively and efficiently deployed in the organisation.

The risk management of IT governance focuses on dealing with issues of risk, compliance and standards using frameworks such as COBIT, ITIL and other ISO standards. Several studies reveal that COBIT benefits are associated with aligning IT with business objectives in

organisations (De Has & Van Grembergen, 2009; Looso, 2010; IT Governance 2011; Nugroho, 2014). Corporate governance ensures that IT is represented at board level in organisations (Looso, 2010; IT Governance 2011; Nugroho, 2014). IT governance is based on corporate governance principles to manage and use IT to achieve corporate performance goals (Coertze & Von Solms, 2013; Turel & Bart, 2014). Nugroho (2014) says that “IT governance is not concerned with the location and distribution of the IT resources themselves, but rather with the distribution of managerial responsibilities and control that ultimately affect how IT resources are utilized in organisations”.

The IT decision making area IT governance focuses on the allocation of decision rights and accountabilities in the use of IT in organisations (Weill, 2004; Musson, 2009; Coertze & Von Solms, 2013; Turel & Bart, 2014). Weill (2004) says “IT governance represents the framework for decision rights and accountabilities to encourage desirable behaviour in the use of IT in organisations. Whereas management is about what specific decisions are to be made, governance is about systematically determining who makes each type of decision, who has input to a decision and how these people are held accountable for their role”.

Amongst other things, IT governance is tasked with deciding on how decision rights and accountability are distributed in organisations to avoid ad hoc decision making (Holck et al., 2005; Hicks, Pervan & Perrin, 2012; Pasquini & Galie, 2013; Pereira, Almeida & Mira da Silva, 2014). In order to improve IT governance in organisations, Weill (2004) proposes the assignment of decision rights to five IT decision areas (architecture, infrastructure, principle, applications and investment) in organisations. The assignment of responsibilities and roles to decision-making domain areas helps to achieve a balanced governance structure for IT adoption decision making in organisations (Larsen, 2003; Kim et al., 2009; Kim et al., 2014).

Kim et al., (2014) note that IT adoption decision rights on organisations are becoming increasingly more important and complex due to diversity of stakeholders needs. Many researchers continue to explore the concept of IT governance in an attempt to find appropriate mechanisms to govern IT adoption decision making in organisations, in order to be accountable to shareholders and stakeholders (Looso & Goeken, 2010; Lee & Setiawan, 2013; Latif & Hanifi, 2013). Although IT governance as a framework may improve controls with respect to the alignment of IT and business objectives, it pays less attention to how IT adoption decisions are made in organisations (Musson, 2009; Kim & Lee, 2014).

A major challenge for IT governance is the lack of understanding of how decisions are made in order to achieve business objectives (Weill & Ross, 2005; Offenbeek, Boonstra & Eseryel, 2013; Othman & Chan, 2013). Organisations need frameworks to address the IT requirements of different business units' stakeholders in organisations (Weill et al., 2005); hence IT adoption processes need to involve all stakeholders in organisations (Holick et al., 2005). An important factor of an IT governance decision making process is determining where in the organisation decisions are made (Weill et al., 2005; Valencia, 2014; Teo, Manaf & Choong, 2013). IT governance needs to promote the participation and engagement of stakeholders in IT adoption issues in organisations (De, Haes & Van Grembergen, 2008; Lackovic, 2013; Kim et al., 2014, Goosen & Rudman, 2013; Donnelly, 2010; Chergui, Sayouti & Medromi, 2013).

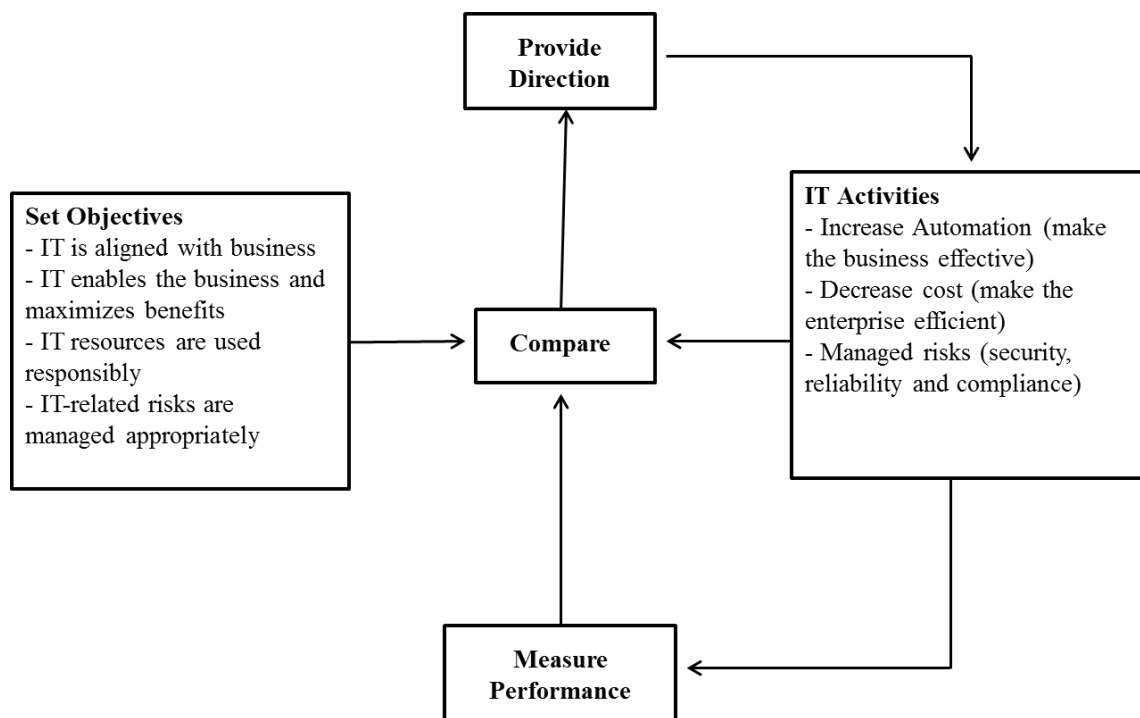


Figure 2.4: IT Governance Framework (Source: Jokonya 2011:38)

Jokonya (2011) argues that it is important for business leaders (executives) to be fully engaged in IT governance in order for the organisation to achieve business objectives. The biggest challenge in organisations is to reconcile different business units' objectives derived from the nature of their functions. Coertze et al. (2013) note that for an organisation to benefit from IT adoption there is a need for coordination from both IT and the business side of the organisation. The failure to align business and IT strategy will make it difficult to realize

value from IT adoption in organisations. IT and business alignment ensures that IT adoption meets the business needs of the organisation (ISACA, 2012; IT Governance, 2008). Lorences et al. (2013) contend that strong IT governance can ensure the proper alignment of business and IT strategy in organisations.

IT Governance Institute (2008) claims that poor IT governance is costing organisations billions of dollars each year after failing to improve business performance as expected. IT governance ensures that IT decisions consider the business objectives and goals as shown in Figure 2.4. The proper IT governance structure has been credited with better IT related decision in organisations as it helps to get buy-in from business units (Posthumus, Von Solms & King, 2010; Pereira & Mira da Silva, 2012; Ali & Green, 2012; Almeida, Pereira & Mira da Silva, 2013). The single important predictor of whether an organisation will benefit from IT investment is an effective IT governance structure (IT Governance Institute, 2008). Jokonya (2011) suggests that there is a need for new methods to justify IT adoption investment, which identify and quantify the intangible benefits in organisations.

Several researchers found that a balance of IT and business representatives in IT decision making is important to IT governance performance outcomes in organisations (Bowen, Cheung & Rohde, 2007; IT Governance, 2008; IT Governance, 2011). The same researches revealed a relationship between project success, business benefits and IT governance. Bowen et al. (2007) point out that the challenge of implementing IT governance in organisations is meeting the needs of multiple stakeholders. Bowen et al. (2007) note that most researchers associate IT governance with the structure for making IT decisions in organisations. Bowen et al. (2007) contend that focusing on the structure aspect only of IT governance ignores other important activities. Bhattacharjya and Chang (2009) contend while organisations appreciate the importance of IT governance they realize that it is a complex undertaking as it is difficult to implement. De Haes and Van Grembergen (2008) propose an IT governance framework based on structure (defined roles and responsibilities), processes (strategic decision making, standards and frameworks) and relational mechanisms (dialogue between IT, Stakeholders and business).

Several researchers concede that the challenge of IT adoption decision making is getting agreement from different stakeholders' constituencies who disagree on goals and how to



achieve them (Luftman & Ben-Zvi, 2010; Luftman & Derksen, 2012; Ahlan, Ajayi & Arshad, 2014). The reductionist approach to IT governance has been seen to pose challenges to complex modern organisations (Peterson, 2004; Lee & Setiawan, 2013). The complexities of IT governance mean organisations need to work with different paradigms to offer multiple insights to the complex phenomenon (Peterson, 2004; Balocco, Ciappini & Rangmore, 2013; Al Omari, Barnes & Pitman, 2012). The systems approach has been credited with acknowledging the complexity and dynamic nature of IT governance in organisations (Cordoba, 2009).

In summary, whilst the literature acknowledges the importance of effective IT governance in organisations, it is still a challenge to many organisations. The major challenge is satisfying different stakeholder constituencies with different worldviews in organisations, to the benefits of IT adoption. The challenges of IT adoption decision making in organisations may require different paradigms to understand the problem context before making decisions. The next section discusses the stakeholder approach to IT adoption decision making in organisations.

## **2.7 Stakeholder Approach**

The previous section discussed IT governance with regards to IT adoption decision making in organisations. Stakeholders have been defined as individuals or groups with an organisational interest (stake) who may be impacted by the decisions (Freeman, 1984; Freeman, 2011; Achterkamp et al., 2013). Although stakeholder theory has been widely accepted in information systems research, examination of the impact of stakeholder conflicts in IT adoption is relatively new (Cordoba, 2009; Achterkamp & Vos, 2008; Boonstra & de Vries, 2008). This has prompted many researchers to ask whether IT adoption decisions in organisations are made in the interest of stakeholders or executives (Cordoba, 2008; Mirza, 2010; Hansen, 2009; Mitchell et al., 2011; Muswaka, 2013). A major challenge is to decide who makes decisions on IT adoption issues in an organisation.

Cordoba (2009) noted that the stakeholder approach addresses some relationship management issues in line with stakeholders' concerns and values. Stakeholder management and relationships are likely to contribute in addressing ethical and social issues which can cause IT adoption failures in many organisations (Freeman, 2010). In many cases IT adoption decisions taken by organisations are not supported by other stakeholders who have different interests. Stakeholders always have diverse world views about the benefits of IT adoption in organisations (Achterkamp et al., 2013).

Stakeholder participation can overcome strategic management issues of poor communication and lack of commitment (Achterkamp et al., 2013). The stakeholder concept is based on the need to involve the affected stakeholders in decision making (Freeman et al., 2011). The issue of who is to be involved in the debate about the problem situation is important to the stakeholder approach. To be holistic, the stakeholder approach should shift focus from looking only at internal stakeholders to including stakeholders outside the organisation (Freeman et al., 2011; Achterkamp et al., 2013). The wider consultation of stakeholders external to the organisation is likely to achieve a holistic approach in addressing stakeholder concerns in achieving business objectives.

The exclusion of certain stakeholders in a problem situation results in a different solution to the problem (Achterkamp & Vos, 2007; Freeman, 2010). Stakeholder engagement allows for the accommodation of stakeholder concerns in system improvement to emerge. Stakeholder involvement has received considerable attention in organisational practice since most challenges facing organisations are on how to manage stakeholder relationships (Achterkamp & Vos, 2007). They add that one of the fundamental achievements of the stakeholder approach has been addressing issues of stakeholder identification. Table 2.1 below shows the stakeholders analysis steps.

Step 1	Identify a vision or objective
Step 2	Describe a number of future states in terms of goals understandable by the stakeholder group
Step 3	Break the goals down into the process, technology, and organisation and culture steps necessary to balance the organisational equilibrium
Step 4	Identify the stakeholder groups whose commitment is necessary to achieve each goal
Step 5	For each type of stakeholder, describe the needed changes, perceived benefits, and expected kinds of resistance
Step 6	Analyse the effort required to gain the necessary commitment from the stakeholder group
Step 7	Develop action plans for those stakeholder groups that are not committed enough

Table 2.1: Stakeholder Analysis (Source: Pouloudi 1999, p. 9)

The challenge to IT adoption decision making in organisations is reaching consensus where stakeholders' constituencies have diverse worldviews about IT adoption benefits (Cordoba, 2007; Holick et al., 2005). Most IT adoption failures in organisations have been cited as associated with inadequate exploring of stakeholder requirements and making decisions without involving the affected stakeholders (Bryson, 2004; El-Gohary et al., 2006; Fassin, 2009; Bernroider, 2008; Mirza, 2010). The independent creation of IT adoption decisions without consulting the affected stakeholders in the organisation results in a gap in the intended needs of the affected stakeholders (Esser, 2005; Beale, 2007; Eskerod & Jespen, 2012; Fauzi, 2013). Organisations have been urged to focus on meeting user requirements when adopting new systems (Lawrence, 2010; Lyytinen & Newman, 2008; Freeman et al., 2004; Hoyle & Goffnet, 2013).

Most existing IT adoption models and frameworks are too deterministic in assuming that stakeholders will automatically see the benefits of IT adoption in organisations (Weilbach, 2010). Benefits of most IT adoptions in organisations are not obvious to all stakeholders due to different worldviews. Many researchers have highlighted the importance of stakeholder participation in the success of IT adoption in organisations (Pan, 2005; Pan, 2009; Cordoba, 2009), hence the involvement and participation of stakeholders have been found desirable in IT adoption decision making (Jokonya & Hardman, 2011). Therefore, it is vital to involve stakeholders with opposing interests in the IT adoption decision-making processes in organisations (Jepsen & Eskerod, 2009; Mirza, 2010; Reynolds, 2014).

According to Lyytinen et al. (2008), deciding who determines the important factors to consider during IT adoption is important in organisations. Organisations have been urged to involve stakeholders in IT adoption as it facilitates the finding of solutions for those closest to the problem situation (Tan et al., 2005; Zhang et al., 2005; Beale, 2007). A user-centered design approach has been recommended for accepting stakeholders' inputs and in turn communicating decisions back to the affected stakeholders in organisations (Iacovou & Dexter, 2005; Vos & Achterkamp, 2006; Boguslavsky, 2012).

Stakeholder participation refers to stakeholder involvement in IT adoption decision making in organisations (Surry, 2009; Freeman, 2011; Achterkamp et al., 2013). Stakeholder participation from a theoretical perspective appears simple, however in many cases decision makers view users as passive actors, underestimating their potential contribution to IT adoption success in organisations (Surry, 2009; Achterkamp et al., 2013). While managers are

concerned about the cost of IT adoption exercise, users are more concerned with functionality and service (Holick et al., 2005; Doherty, 2009). IT adoption requires a holistic approach in decision making through the creation of a rich relationship that bridges complex multi-stakeholder differences (Waddell, 2005). Holistic changes require new ways of thinking towards the whole organisation and the examination of deep structures of the organisation (Waddell, 2005; Flick & Rose, 2005; Freeman et al., 2010).

Cordoba (2009) contends that the importance of stakeholders in IT decision making in organisations has been emphasized by many researchers (for example, Checkland, 1990; Pan & Pan, 2006). Many researchers concur that most failures of IT adoption projects are associated with not satisfying stakeholder demands (Vidgen, 1997; Pan, 2005; Pan, Pan & Newman, 2007; Pan, 2009). Pouloudi (1999) states that stakeholder participation is important in information systems decisions as its success do not depend only on technical aspect in theory and practices but also on social aspects. In conclusion this section highlighted the importance of the stakeholder approach to IT adoption decision making in organisations. This section notes that the diversity of stakeholder worldviews is a challenge to IT adoption decision making in organisations. It advised the solution to IT adoption to come from those affected and closer to the problem situation. The next section discuss the sociological paradigm with regard to IT adoption decision making in organisations.

## **2.8 Sociological Paradigms**

The previous section discussed stakeholder approach with regards to IT adoption decision making in organisations. Kuhn (1996) defines paradigms - also called worldviews (ways of seeing things) - as assumptions, beliefs and ideas that guide and shape a particular authoritative scientific research community. Sociological paradigms may offer managers a way to look at problem situations from different perspectives (Jackson, 2003; Stacey, 2007; Sadri, 2013; Tittenbrun, 2014). Paradigms offer best ways of accounting for the nature of reality of the IT adoption problem situation in organisations. The incommensurability thesis, which caused paradigm wars in that it is difficult to reconcile different paradigms, has been resolved. The incommensurability thesis of paradigms makes them contradictory to each other. However some researchers have argued for creativity in embracing different paradigms in addressing IT adoption problem situations instead of promoting the radical different alternative perspectives (Whittington, 2013; Urick, 2012; Venable, 2011; Hassan, 2013).

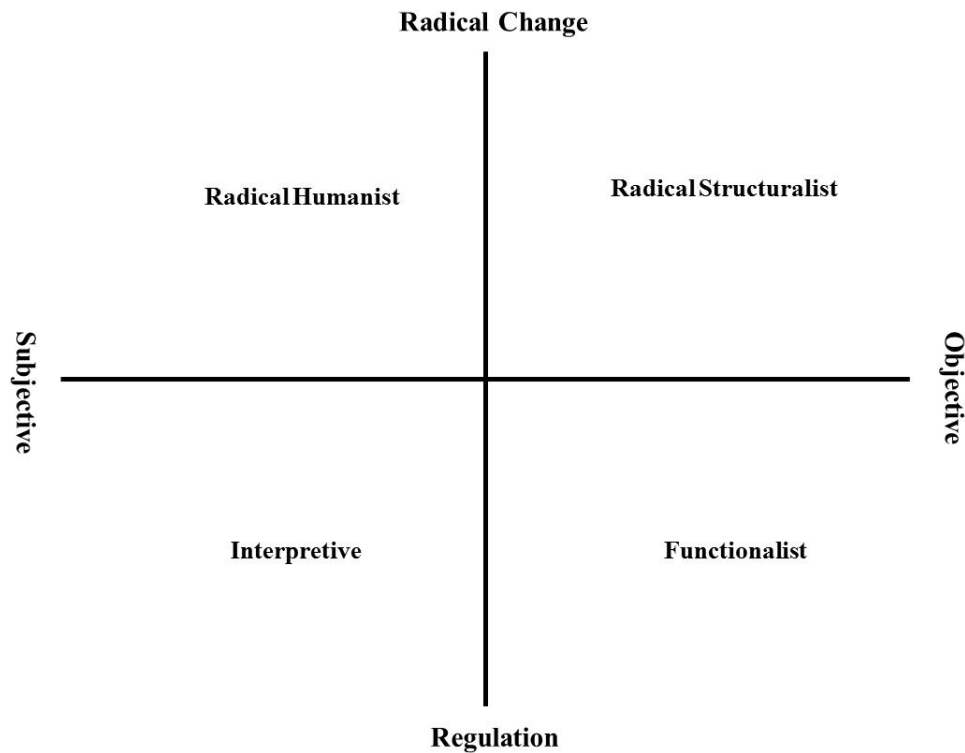


Figure 2.5: Four Sociological Paradigms (Source: Burrell & Morgan, 1979).

Burrell and Morgan (1979) claim that sociological paradigms of social theory can be classified into four categories: functionalist, interpretive, radical structuralism and radical humanism as shown in Figure 2.5. The framework topology is based on regulation-radical changes and subjective-objective axes shown in Figure 2.5. The two dimensions yield four distinctive sociological clusters with each paradigm based on certain assumptions on how individuals or groups accept evidence (Sulkowski, 2010; Whittington, 2013; Urlick, 2012; Venable, 2011)

The four categories are based on the nature of reality (subjective-objective) and the aspect of social order (radical change – regulation). The assumptions of objectivists are that realities are independent of individual as they are external to individuals. The assumption of the subjectivist is that reality is socially constructed and is not independent to the individual who may interpret differently (Ardalan, 2011; Cronje, 2011; Peterson, 2010; Fors & Lennerfors, 2013). The assumptions of regulation are based on the perception of social order. A radical change assumption is that oppression exists in organisations and radical change is necessary for the oppressed to free themselves. These sociological paradigms are not mutually exclusive, yet offer a reasonable guideline as to where the main emphasis of an approach lies

and to what managerial end it lends itself. The adoption of these sociological paradigms affects the way organisations perceive a problem situation and assists the management to better understand the sociological underpinnings of organisational theory (Ardalan, 2011; Cronje, 2011; Blyth, 2012; Lotrecchiano, 2013).

The paradigm is a way of classifying similar theorist perspectives together in the ways they approach a problem situation (Burrell et al., 1979; Stacey, 2007). In order for individuals to change their ways of thinking they first need to abandon their old worldview (Ardalan, 2011; Cronje, 2011; Kendall, 2013; Wilkinson, 2013). In order to understand a different paradigm we need to change from the taken-for-granted assumptions. The existence of multiple paradigms is therefore important to expand our perception of the knowledge base on IT adoption decision making in organisations. When studying IT adoption decision making in organisations, it is necessary to consider multiple paradigms as each paradigm highlights and emphasises different aspects of this complex social phenomenon. In addition, each paradigm may require different analytical procedures and data sources (Bouwman et al., 2005; Uhl-Blen, Marion & Mckelvey, 2007; Bulgaru, 2013). The next sub-sections discuss the different paradigms which are different ways of looking at problem situations in organisations.

### **2.8.1 The Functionalist Paradigm (Objective-Regulation)**

This section discussed sociological paradigms with regard to IT adoption decision making in organisations. This sub-section discusses the functionalist paradigm with regard to IT adoption decision making in organisations. The functionalist paradigm is based on the assumption that organisations are stable and rarely undergo radical change. The assumption of a stable and orderly entity leads to emphasis of a high degree of planning, the perception of physical boundaries and hierarchical organisational structure (Hussain & Flynn, 2002; Ardalan, 2011; Cronje, 2011; Peterson, 2010; Fors & Lennerfors, 2013; Blyth, 2012). This is the most popular paradigm and it is based on the assumption that human actions are rational and organisational behaviour can be hypothesized. The functionalist paradigm's emphasis is to promote and ensure that organisations are adaptive, efficient and effective in order to survive.

The functionalist paradigm relies on scientific methods to achieve its objectives of eliminating inefficiency and disorder in organisations (Babintsev & Sapryka, 2013). The intervention goal of this paradigm is to help individuals or groups to adapt to the existing structures without the need for major institutional structure change (Whittington, 2013; Urick,

2012; Venable, 2011; Hassan, 2013). Society is assumed to have shared values that help establish social order to the benefit of every member. The functionalist paradigm assumes that people's perceptions are fixed and they have the same worldview (mental models). The other assumption from an IT adoption point of view is that the requirements and needs of IT adoption already exist and will be discovered through analysis. The perceptions of stakeholders are not required as their views are treated as subjective and irrational. The management assumes to know the requirements and needs of the system. The next sub-section discuss the interpretive paradigm with regard to IT adoption decision making in organisations. The next sub-section discusses the interpretive paradigm with regard to IT adoption decision making in organisations.

### **2.8.2 The Interpretive Paradigm (Subjective-Regulation)**

The previous sub-section discussed the functionalist paradigm with regard to problem situations such as IT adoption in organisations. This sub-section discusses the interpretive paradigm with regards to IT adoption decision making in organisations. The interpretive paradigm is based on the assumption that IT adoptions in organisations are social constructs which are part of human interaction (Whittington, 2013; Urick, 2012; Venable, 2011; Hassan, 2013). The interpretive paradigm assumes that organisations' agreements are reached through consensus with no radical change to the status quo. The consensus emerges as part of social constructs through human interaction and reality is intangible as it is part of human consciousness and subjectivity. The interpretive paradigm seeks to understand the subjective world in terms of processes. The social situation's meaning is understood through the interpretation of individual perceptions of viewing things. The goal of intervention is to assist members to reframe events as part of understanding IT adoption decision making in organisations.

The interpretive paradigm supports subjectivity since different stakeholders have different meanings to IT adoption in organisations (Ardalan, 2011; Cronje, 2011; Peterson, 2010; Fors & Lennerfors, 2013). Interpretive paradigms encourage stakeholder participation and involvement to gain their commitment. The ways of interaction, communication and language used are important to reach consensus on IT adoption problem situation. The IT adoption requirements emerge through a change of stakeholders' worldviews as they learn from each other's different worldviews. The stakeholders close to the problem situation are assumed to be more knowledgeable about the problem situation and are best to be consulted to

understand the IT adoption requirements in organisations (Whittington, 2013; Urick, 2012; Venable, 2011; Blyth, 2012). The next sub-section discuss the radical structuralist paradigm with regard to IT adoption decision making in organisations.

### **2.8.3 Radical Structuralist Paradigm (Objective-Radical Change)**

The previous sub-section discussed the interpretive paradigm with regard to IT adoption decision making in organisations. The radical structuralist paradigm's assumption is that political and economic crises within society's inherent structural conflicts are responsible for constant change. The world we live in is viewed as unjust and untenable because of underlying contradictions and irregularities (Whittington, 2013; Urick, 2012; Venable, 2011). The IT adoption intervention strategy in organisations needs to be integrated at all levels to achieve transformation change of the distressed social system. The assumption of the radical structuralist paradigm is that social conflicts shape the IT adoption decision making in organisations.

The social conflicts are caused by the oppression of other parties in organisations which may result in radical change as the oppressed try to free themselves. The IT adoption reality is viewed as objective and concrete, which arises from the social conflict among different stakeholders (Hussain & Flynn, 2002; Ardalan, 2011; Cronje, 2011; Peterson, 2010; Fors & Lennerfors, 2013). The radical structuralist paradigm assumption is that there are oppressed groups during IT adoption decision making in organisations. Its emphasis is on emancipating the oppressed by revealing all forms of power domination and encouraging reforms to the current social order. The discrimination can be based on sex, age, race, class and status.

The radical structuralist paradigm assumes that organisations are characterised by power domination that results in conflicts and instability. The social conflicts which always exist have a potential for radical change as the oppressed seek to escape from the control. The assumption of a radical structuralist paradigm on IT adoption is that the stakeholders do not have expertise with regard to their requirements and needs. The stakeholder requirements and needs are built by representatives in organisations. The stakeholders are treated as less knowledgeable in terms of their requirements and needs on IT adoption decision making in organisations. The next sub-section discusses the radical humanist paradigm with regard to IT adoption decision making in organisations.



#### **2.8.4 Radical Humanist Paradigm (Subjective-Radical Change)**

The previous sub-section discussed the radical structuralist paradigm with regard to IT adoption decision making in organisations. The radical humanist paradigm is based on subjectivist reality with potential for radical change as part of transformation (Hussain & Flynn, 2002; Whittington, 2013; Urick, 2012; Venable, 2011). The main agenda of change is the freeing of humans from impediments that limit their full potential. The paradigm views large institutions as full of controls of social opportunities and ideologies which marginalize other members of the social system. The radical humanist paradigm assumption is that modern organisations and society problem situations are too complex to be understood using one paradigm. It challenges the idea of guaranteed improvement during IT adoption intervention and encourages diversity of paradigms.

The concern of a radical humanist paradigm is the removal of social constraints that limit human potential in organisations. Theorists of this paradigm see the need for radical change to improve the existing situation (Whittington, 2013; Urick, 2012; Venable, 2011; Hassan, 2013). Organisations are not seen as stable as they are liable to change caused by human social consciousness. Social interventions in organisations help to change economic and social structures. The radical humanist paradigm sees change as healthy for the organisations to survive. The stakeholders' different subjective worldviews and interests are accommodated during IT adoption decision making in organisations. The ease of adaptability ensures flexibility to change and has a potential to emancipate stakeholders during IT adoption decision making in organisations. The IT adoption requirements and needs are part of social constructs of subjective interests and stakeholders' worldviews are accounted for through debates to reach mutual agreements. The next section summarises sociological paradigms with regards to IT adoption in organisations.

#### **2.8.5 Sociological Paradigms Summary**

To summarise, the sociological paradigms are important to understand IT adoption problem context from multiple paradigms before decisions are taken on the IT adoption in organisations. IT adoption as a complex phenomenon needs to be viewed from different paradigms in order to understand the problem context. The four sociological paradigms are therefore important in structuring the problem context before taking decisions on IT adoption in organisations. Since organisational contexts are always different, the sociological paradigms are therefore important in finding the appropriate worldview to the nature of IT

adoption problem situation at hand before making an intervention. The next section discuss the systems approaches with regard to IT adoption decision making in organisations.

## **2.9 Systems Approaches**

The previous sections discussed the sociological paradigms with regard to IT adoption decision making in organisations. This section discusses the systems approaches with regard to IT adoption in organisations. Systems approach in an interdisciplinary way to view complex problems in a social system. Several attempts were made to incorporate holism into management and organisation theory, such as systems engineering for optimizing performance (Jackson, 2010; Reynolds & Ulrich, 2010). Most of the scientific management approaches failed to recognize the social aspect and purposeful nature of organisations (Jackson, 2003). The traditional scientific management approaches were successful in dealing with goal specific problem situations with set objectives (Jackson, 2003). Organisations as social systems containing human beings do not always have specific goals and agreed objectives (Hummelbrunner & Reynolds, 2013). In addition organisations have multiple purposes which are seen differently by different stakeholders. Stakeholders who are groups or individuals with interests in the organisation do not always share the same objectives and goals (Freeman, 2011).

Midgley (2007) contends that systems approaches emerged to address the failure of traditional reductionist approaches to cope with complex organisational problems. Systems approaches believes that organisations are complex and unpredictable which makes it impossible to understand them using reductionist approaches. Systems approaches are therefore a corrective measure to the shortcomings of reductionism's failure to address complex problems in organisations. The ever-changing organisational environment cannot therefore be predicted, which justified the need of a new view of organisation systems (Mingers, 2007).

Jackson (2010) concedes that the challenge of reductionism is that it offers simple solutions to complex organisational problems where sophisticated solutions are needed. Systems approaches challenges the use of predefined blueprint models to solve complex organisational problems such as IT adoption. Systems approaches' major strength is its trans-disciplinary nature, which draws concepts and ideas from different disciplines (Reynolds, 2014). In that case there are complementarities of different strengths from different disciplines to address complex IT adoption problem situations in organisations. The trans-disciplinary nature of

systems approaches affords it richer insights to the complex IT adoption in organisations, which makes it more suitable to tackle complex real world problems than is possible with a single discipline (Cavana, Boyd & Taylor, 2007; Cabrera, Colosi & Lobdell, 2008; Jackson, 2010).

Cordoba (2009) concedes that systems approaches encourage the analysis of stakeholder perspectives prior to IT adoption and allow for reflection to occur on possible alternative improvements. The appreciation of interdependencies among elements of systems following systems approaches is vital as it improves on IT adoption decision making, since this in turn reduces the chances of overlooking important elements (Petkova & Petkov; 2003; Waldman, 2007). Cordoba (2009) says that “information systems are social artifacts that people can shape according to their interests and a particular context”. He urges managers to take a holistic approach to IT adoption decision making in organisations, which is a complex phenomenon.

IT researchers have been urged to become more aware of different strengths and weaknesses of different systems approaches as they focus on addressing stakeholder needs at the expense of technology demands (Cordoba, 2009; Jackson, 2010; Bosch, Nguyen & Sun, 2013). Systems approaches’ emphasis is on trying to reconcile the organisation’s technical requirements and the social aspects of human needs. Systems approaches view the hard systems and soft systems as complementary not as antagonists during IT adoption decision making in organisations. The socio-technical system emphasis is on the interaction of technical and social requirements in technology adoption in organisations. It is through interaction of social and technical factors that IT adoption unlocks benefits and opportunities in organisations.

Jokonya and Hardman (2011:2] write that “systems approaches avoid hardening of some taken-for-granted assumptions that influence IT adoption decision making in organisations as it enables collective reflection and debate on implications that the decision may have for different stakeholders”. Organisations have been urged to view IT adoption decision in organisations as a social phenomenon which needs systems approaches to reveal stakeholders constituencies competing interests (Klecun & Cornford, 2005; Houston, 2007; Checkland, 1990; Silverman, 2010; Hummelbrunner, 2011).

Many researchers have highlighted the need for a multi-disciplinary (social and natural

sciences) approach to address complex IT adoption decision making and information systems challenges in organisations (Petkova & Petkov, 2003; Katy & Boyack, 2010). While the laws of natural science are deterministic, social systems such as IT adoption decision making are agreed upon by people through consensus (Cabrera et al., 2008; Katy et al., 2010). Systems approaches which are pluralistic in nature allow different stakeholder interests to be accommodated and compromises to be struck (Midgley, 2006).

Systems approaches help to include (sweep-in) as many factors as possible to understanding problem situations in order to improve the situations, not solve the problem (Parrish & Courtney, 2009; Reynolds & Holwell, 2010; Henry, 2013). Individual worldviews in organisations are a mix of values and understanding gathered through education and experience (Cabrera et al., 2008; Morris, 2009; Henry, 2013). The individual worldviews are therefore the core to the individual's perception on issues that take place in organisations and how they interpret and understand the world. Cordoba (2009) asserts that in order to manage change in organisations it is necessary to appreciate existing worldviews.

The success of the systems approach in Information Systems (IS) research has been attributed to its interdisciplinary nature and its viewing of problem situations in terms of wholeness (Cordoba, 2009; Jackson, 2010). Jokonya and Hardman (2011) concede that systems approaches which are an inquiry process allow collective IT adoption decision making in organisations which may not be clear from the start as it is part of learning process to reach a resolution.

Cordoba (2009) says that “the interest in the study of information systems in organisations has shifted to social issues (soft systems) rather than technical issues (hard systems)”. Therefore, addressing a variety of soft issues during IT adoption decision making in organisations has become important for successful adoption (Cordoba, 2009; Jackson, 2010; Reynolds, 2014). Most IT adoption challenges are interrelated due to the complex socio-technical nature of modern organisations (Conlon & Carew, 2005; Monreal, Valerdi & Latif, 2014). Although most literature recognizes that IT adoptions in organisations are complex in nature, most researchers are still more focused on traditional hard systems thinking approaches (Jokonya et al., 2011; Monreal, Valerdi & Latif, 2014). Managers have been advised to balance the hard and soft system models to achieve efficiency and flexibility in organisations (Jackson, 2010; Silvius, 2009; Skulmoski & Hartman, 2009).

The Systems of Systems Methodology (SOSM), Figure 2.6, provides a guide on how systems approaches can be applied to address a problem situation. SOSM classifies systems approaches based on the matrix of complexity of a problem situation (simple or complex) and the degree of shared purpose of stakeholders (unitary, pluralist and coercive relationships). Based on Figure 2.6 the hard systems approaches are considered unitary (simple or complex), soft systems approaches are considered pluralist (simple or complex) and critical systems approaches are considered as coercive (simple or complex) relationships.

Participants dimension of contexts (increasing diversity of values)			
Systems dimension of contexts (increasing complexity)	Unitary Hard Systems Approaches		Coercive Emancipatory Systems Approaches
	Pluralist Soft Systems Approaches		
Simple	Simple-unitary problem contexts •Operations research (OR) •Systems engineering (SE) •Systems analysis (SA)	Simple-pluralist problem contexts •Strategic assumption surfacing and testing (SAST)	Simple-coercive problem contexts •Critical systems heuristics
Complex	Complex-unitary problem contexts •System dynamics •Organizational cybernetics •Complexity theory	Complex-pluralist problem contexts •Interactive planning •Soft system methodology	Complex-coercive problem contexts •Critical systems approaches •Total system intervention

Figure 2.6: SOSM System Approaches (Adopted from Jokonya et al. 2013)

The simple/complex dimension in Figure 2.6 relates to the levels of interrelatedness and interdependencies; and the unitary, pluralist and coercive dimensions in Figure 2.6 relate to the levels of engagement with multiple perspectives (Reynolds and Ulrich, 2010; Jackson, 2010). The systems approaches shown in Figure 2.6 are not mutually exclusive possibilities, but offer a reasonable guideline as to where the approach's main emphasis lies, as well as to which managerial end it most easily lends itself. The SOSM Figure 2.6 is based on the assumption that there is a fit between system approaches and problem contexts (Reynolds and Holwell, 2010; Jackson, 2010). The SOSM logic is that any single type of problem context can be assigned meaningfully to a conforming (dominant) systems approach. The next section presents the hard systems thinking approach in addressing IT adoption decision making in organisations.

### **2.9.1 Hard Systems Thinking Approaches**

The previous section introduced systems approaches with regard to IT adoption decision making in organisations. The section discusses hard systems thinking approaches with regard to IT adoption decision making in organisations. Hard systems thinking approaches, which are based on reductionism, are useful in problem contexts with clear objectives, as shown in Figure 2.6. In both cases there is an agreement on the objectives of IT adoption in organisations. The hard systems thinking approaches which are also known as the goal seeking and viability systems approaches have an emphasis on prediction and control to achieve desired objectives which are outside human observation (Jackson, 2009; Reynolds & Ulrich, 2010). The organisational world is seen as having a clearly identifiable purpose made up of systems which can be objectively studied.

The traditional hard systems thinking approaches such as operational research, systems analysis and systems engineering are classified as simple-unitary approaches (see Figure 2.6). Applied hard systems thinking approaches such as systems dynamics, complexity theory and organisational cybernetics are classified as complex unitary approaches (see Figure 2.6). Applied hard systems approaches encourage multidisciplinary and interdisciplinary approaches to IT adoption decision making in organisations (Stacey, 2007; Richardson & Midgley, 2007; Jackson, 2006). The hard systems thinking assumption about problem contexts is that individuals have unitary and shared agreed objectives to IT adoption decision making in organisations (Jackson, 2010; Reynolds & Ulrich, 2010).

Hard systems thinking is suitable for IT adoption problem situations where stakeholders have shared worldviews with the only problem being to find the most efficient means to achieve agreed on objectives (Jackson, 2010). Most of these structured problem situations are at the organisation operational level with well-defined measures of performance and involve the use of scientific methods to solve them. The major challenge of hard systems thinking is its failure to deal with stakeholders' multiple worldviews of reality in organisations, since its assumptions are that goals exist (Stacey, 2007; Rosenhead, 2009; Jackson, 2011). Hard systems thinking faces challenges when confronted with complex problem situations of a subjective nature with multiple interpretations of reality in which mathematical models are not applicable (Jackson, 2005). Most IT adoption problems in organisations cannot be quantified and modeled using mathematical constructs.

Katy and Boyack (2010) claim that while hard systems thinking approaches have been very

successful in simple problem situations they have limited applicability in subjective social systems like IT adoption decision making. Hard systems thinking approaches which are based on reductionist approaches, assume that objectives are always clear and problems are viewed as being decomposable and each component may be understood independently (Stacey, 2003; Katy & Boyack, 2010). The realities facing organisations today are too complex and subject to change, which makes it difficult to reduce IT adoption problem situations as amenable to scientific modeling. In addition it is very rare to have a situation in which stakeholders have shared objectives to IT adoption problem situations in organisations. In pluralistic and coercive problem contexts, hard systems thinking approaches distorts and offers a limited view of the reality (Stacey, 2003; Rosenhead, 2009).

The hard systems thinking approaches fail to appreciate an organisation's social, cultural and economic aspects or its complex matrix dimension (Katy & Boyack, 2010; Stacey, 2007). IT adoption decision making ought not to be viewed through a simplistic lens of reductionism but by augmented systems approaches aimed at exploring stakeholder interests (Katy & Boyack, 2010). Most researchers concede that IT adoption decision making in organisations is too complex with no agreed objectives (Reynolds et al., 2010). This shows that hard systems thinking approaches appear incapable of dealing with some of the complexity associated with IT adoption in organisations (Jackson, 2010).

Hard systems thinking approaches focus on an objective problem while failing to address a human activity situation which is unstructured (Luoma, 2007; Jackson, 2010). The hard systems thinking's view that systems can be understood from isolated parts may no longer be applicable to today's complex organisational problems (Stacey, 2007; Lyytinen et al., 2008; Jackson, 2010). Most literature on IT adoption decision making pays much attention to hard systems approaches of efficiency and effectiveness, thereby largely failing to acknowledge the complexities of modern organisations (Bernroider, 2008). The next sections discuss some examples of complex hard systems thinking approaches such as systems dynamics, organisational cybernetics and complexity theory.

#### **2.9.1.1 Systems Dynamics**

The previous section discussed the hard systems thinking approach in addressing IT adoption decision making in organisations. Jackson (2003) defined system dynamics as an interdisciplinary approach that helps managers to find issues important to improve their organisations. Senge (2006) concedes that system dynamics encourages organisational

learning as part of managing mental models through questioning different taken-for-granted assumptions. System dynamics' objective emphasis on understanding social systems is its major weakness as it ignores subjective issues of IT adoption decision making in organisations. The tendency of assuming a unitary purpose in IT adoption decision making results in the system serving the needs of the powerful stakeholders at the expense of the affected (Cabrera et al., 2008). Despite system dynamics' emphasis on mental models and learning, it is still functionalist in nature because it sees structures as important to system behaviour (Jackson, 2003; Stacey, 2007; Lyneis & Ford, 2007). Its emphasis is still on being able to predict social system behavior to ensure stability and as a means of control for managers (Midgley, 2006; Homer & Hirsch, 2006).

The systems dynamics approach does not give attention to the rationale of other systems approaches. Although systems dynamics leans closer to edges of interpretive paradigm it is still a functionalist paradigm (Lyneis & Ford, 2007). The systems dynamics criticism is its emphasis on system structures on human constructed social systems. The emphasis on determinism and free will has seen it lose its credibility for problems of a social nature (Jackson, 2003; Grossler, Thun & Milling, 2008). Its major difference to other hard systems thinking approaches has been its embracing of structuralist as opposed to positivist epistemology. System dynamics has been criticized for being unsuitable for social systems problem situations which involve human interaction. The social systems are understood by subjective interpretation of individual worldviews with the structure being a product of negotiation among stakeholders. System dynamics' use of models of complex social reality and emphasis to study the social systems objectively is an impossible mission (Luoma, 2007; Lane & Husemann, 2008). The next sub-section discusses organisational cybernetics in addressing IT adoption decision making in organisations.

### **2.9.1.2 Organisational Cybernetics**

The previous sub-section discussed the systems dynamics in addressing IT adoption decision making in organisations. Rios (2010) defined organisational cybernetics as an interdisciplinary science which was transferred to the domain of management. Beer (1994) challenges the traditional organisational charts (structures) as unsuitable for modern organisations. Beer (1994) criticizes the organisational charts as they suggest that the person at the top makes all decisions. The viable systems model, which is part of organisational cybernetics, has been credited for being able to steer and provide insights to social systems based on its structuralist epistemology strength and explanatory power (Rios, 2010; Awuzie



& McDermott, 2013). The viable systems model can be of help to organisations in developing a shared understanding of a problem situation. The viable systems model has been attributed to enhancing empowerment and autonomy of parts through decentralization and change of structure. The viable systems model helps to decentralize IT adoption decision making throughout different levels of leadership and is important to management as a diagnosis tool for organisational structures and process (Espinosa, Harnden & Walker, 2004; Midgley, 2006; Schwaninger, 2006; Velentzas & Broni, 2011).

Since the viable systems model is based on structuralist epistemology it has been successful in the design of adaptive and goal seeking entities. Its challenge is that it is unable to handle the human aspect of social systems (Rios, 2010; Brecher et al., 2013). The viable systems model pays little attention to issues of democracy and empowerment during IT adoption decision making in organisations. Although it encourages autonomy of subsystem it has been criticized for increasing control. Since power relationships are part of IT adoption in organisations, the power imbalance can be a source of problems in system interventions if it ends in the wrong hands (Jackson, 2003; Rios, 2010; Brecher et al., 2013). The viable systems model (VSM) based on organisational cybernetics has been criticized for its attempt to use models which are only a partial representation of world reality (Hipel et al., 2007; Lewis & Miller, 2009; Bosch, Nguyen & Sun, 2013). The next sub-section discusses complexity theory with regard to IT adoption decision making in organisations.

### **2.9.1.3 Complexity Theory**

The previous sub-section discussed organisational cybernetics with regard to IT adoption decision making in organisations. Complexity theory has assisted managers to abandon the deterministic approaches of the traditional hard systems thinking that do not cope with the unpredictability and dynamism of organisation environment (Dan & Barclay, 2006; Espinosa & Harnden, 2007; Hummelbrunner & Jones, 2013). Organisations as social systems are too complex to understand as they co-evolve to adapt to the environment. The best that managers can do with complex IT adoption decision making in organisations is to encourage diversity, variety of opinion and learning, as the results may be unpredictable (Hummelbrunner & Jones, 2013).

Complexity theory has been credited with helping managers to understand how complex it is to deal with organisations, enhancing creativity and learning to solve problem situations in organisations (Jackson, 2003; Cabrera et al., 2008; Fan & Kuang, 2013; Awuzie &

McDermott, 2013). Although complexity theory provides knowledge on how to control and manipulate organisations through control parameters, it acknowledges that they are unpredictable (Hummelbrunner & Jones, 2013). Jackson (2003) contends that complexity theory deserves manager's attention as it highlights the complexity, unpredictability and controversial nature of the organisational world. Complexity theory challenges organisational consensus as it prevents expressions of valuable alternative opinions from stakeholders. Complexity theory views organisational politics as necessary for ensuring creativity and learning for the organisation to survive (Haynes, 2008; Cabrera et al., 2008; Hummelbrunner & Jones, 2013).

Complexity theory's natural science origin makes it to be classified under the functionalist paradigm and unable to compete with other systems approaches beyond the functionalist paradigm. Although Stacey (2003) makes attempts for complexity theory to service other paradigms this has been criticized for causing confusion. Its major criticism is that it is part of the natural science domain not the social domain and there is doubt if it can produce its claimed benefits given its immaturity state (Luoma, 2007). From a natural science perspective it may be possible to use complexity theory because of the limited number of deterministic laws, but the challenge is when dealing with social systems influenced by numerous innumerable variables (Stacey, 2007; Jones, 2011). The social systems where humans exhibit self-consciousness and free will cannot be explained the same way as natural systems. The challenge of humans is that they think and learn in addition to disapproving of any laws they do not subscribe to (Courtney et al., 2008; Dennard, Richardson & Goktung, 2007; Gharajedaghi, 2011). The next section discusses the soft systems thinking approaches with regard to IT adoption decision making in organisations.

### **2.9.2 Soft Systems Thinking Approaches**

The previous section discussed hard systems thinking approaches with regard to IT adoption in organisations. Soft systems thinking approaches are suitable for IT adoption problem situations where stakeholders have divergent views about the problem situation (Reynolds et al., 2010). Jackson (2010) says "soft systems thinking approaches are based on the assumption that knowledge can be obtained from interpreting human thoughts and feelings of stakeholders through debate and discussion of the IT adoption problem situation".

Soft systems thinking approaches accept humans as having different worldviews during IT adoption decision making in organisations. Soft systems thinking approaches help address

human complex cultural issues but not technical complex issues (Luoma, 2007; Reynolds et al., 2010; Jackson, 2010). Soft systems thinking approaches' major contribution includes bringing multiple subjective views of meaning to information systems which is not only concerned with technical issues but also understanding purpose before design (Holwell, 2000; Ho, 2014; Reynolds et al., 2010; Jackson, 2010). The subjective nature of soft systems thinking was a major contribution to information systems, where people have multiple perspectives (worldviews) about its benefits to organisations. The success of any intervention to IT adoption is enhanced by open participative debate between stakeholders in the organisation (Jackson, 2003; Reynolds et al., 2010; Jackson, Johnston & Seddon, 2010)

Soft systems thinking approaches seek to accommodate different stakeholders' worldviews during IT adoption decision making in organisations (Jackson, 2003; Cordoba, 2009; Jackson, 2010). Soft systems thinking approaches acknowledge that understating stakeholder worldviews is important during IT adoption decision making in organisations (Jackson, 2003; Checkland & Poulter, 2006; Tawileh, Ivins & Rana, 2006). Soft systems thinking approaches therefore accept that stakeholders have different worldviews about benefits of IT adoption in organisations. Soft systems thinking approaches acknowledge that the truth is subjective and that every worldview may be very restrictive (Cordoba, 2009; Paucar-Caceres, 2009; Checkland, 2010). Soft systems thinking approaches' assumptions are that problem situations are pluralistic in nature with no agreed objectives and goals (Jackson, 2003; Yan & Yan, 2010). Accommodation of multiple subjective worldviews is therefore important during IT adoption in organisations (Jackson, 2003; Checkland & Winter, 2006; Checkland, 2010).

Checkland (2010) notes that systemic learning through exploration of different world views and the appreciation of different world views is important to IT adoption in organisations. The participation of stakeholders in systemic learning helps to gain their commitment during IT adoption in organisations (Jackson, 2010; Yan & Yan, 2010). Soft systems thinking approaches do not subscribe to the notion of predefined models to IT adoption in organisations because of different problem contexts and individuals' world views. Soft systems thinking approaches embrace subjectivity and encourage systemic learning from different stakeholders' worldviews on IT adoption matters in organisations (Yang, 2010; Jackson, 2010; Checkland, 2010). Soft systems thinking approaches help to change individual worldviews through continuous learning and accommodation of different stakeholders' worldviews (Jackson, 2003; Checkland & Winter, 2006; Checkland, 2010).

The challenges of soft systems thinking approaches arise in addressing IT adoption problem situations of a coercive nature and the pluralists bias that consensus can be achieved between different stakeholders (Zhang & Kuang, 2006; Zhang, 2010; Jackson, 2010). Soft systems thinking approaches help to structure and enhance debate but do not address any coercive problem situation (Jackson, 2010). The soft systems thinking approach has limited application to IT adoption problem situations where conflicts or unequal access to power exist and has been criticized for its failure to promote genuine debate, which makes it regulative in nature (Reynolds & Ulrich, 2010). The next sub-sections discuss some examples of soft systems thinking approaches which are: strategic assumption surfacing and testing (SAST) and interactive planning and soft systems methodology (Checkland, 1981).

#### **2.9.2.1 Strategic Assumption Surfacing and Testing**

The previous section discussed the soft systems thinking approaches with regard to IT adoption decision making in organisations. Strategic assumption surfacing and testing is a three methods approach (stakeholder analysis, assumption specification and rating) for understanding a problem situation in a social system (Rasdan, Eriyatno, Affandi & Machfud, 2014). Strategic assumption surfacing and testing is important in helping organisations to make decisions on problem situations based on stakeholder objectives and promoting efficiency, elegance and effectiveness (Sucahyo, Eriyatno, Suroso & Affandi, 2012). The emphasis on stakeholder participation and involvement is important to accommodate diverse world views before an IT adoption decision is taken.

Strategic assumption surfacing and testing demands the participation of different stakeholders in the organisation in finding the solution to a problem situation (Jackson, 2003, Sucahyo et al., 2012; Rasdan et al., 2014). Strategic assumption surfacing and testing pays attention to multiple stakeholders' worldviews in order to understand the complexity of the IT adoption problem context in organisations (Jackson, 2003). Strategic assumption surfacing and testing has been credited for promoting pluralism through encouraging stakeholder participation and involvement in IT adoption problem situations. Strategic assumption surfacing and testing as an interpretive systems approach embraces subjectivity to IT adoption problem situations rather than objectivity.

Reynolds & Ulrich, 2010 (2010) note that system improvements are in the minds of the observer not in the real world and models are partial perception of systems. They concede that to gain full perception of a system requires engagement of multiple subjectivities from

different stakeholders with various worldviews. Strategic assumption surfacing and testing has been credited for encouraging exploring different stakeholder values and perceptions before intervention to an IT adoption problem situation. Critics argue that sometimes it not possible to achieve proper participation and debate because of coercive contexts in organisations (Assimakopoulos & Theodosi, 2003; Sucahyo et al., 2012; Rasdan et al., 2014). This suggests that strategic assumption surfacing and testing is suitable for pluralist contexts but not coercive situations.

Jackson (2003) criticized strategic assumption surfacing and testing for lack of superiority to the existing conventional planning approaches. He notes that SAST's importance to complex IT adoption problem situations is clarifying purpose and finding a way forward, not the problem solution like other approaches. Strategic assumption surfacing and testing has been criticized for its assumption that participants are always willing to expose their assumption (Assimakopoulos & Lydakis, 2003; Sucahyo et al., 2012; Rasdan et al., 2014). In some instances, like coercive contexts, it may not be possible for all participants to reveal their assumptions because of power structures in organisations. The next sub-section discusses the interactive planning with regard to IT adoption decision making in organisations.

#### **2.9.2.2 Interactive Planning**

The next sub-section discusses the strategic assumption surfacing and testing with regard to IT adoption decision making in organisations. Interactive planning (IP) a soft systems approach that subscribes to the view that stakeholder participation and involvement are important in systems design (Ackoff, 1981; Bunker & Alban, 2006; Beer, 2004; Ho, 2014; Midgley, 2006). IP challenges the existence of value free models as misguided to real world situations such as IT adoption decision making. Interactive planning supports that in social systems objectivity is approached through interaction of stakeholders with diverse values (Mingers & White, 2010; Senge, 2006; Midgley, 2006; Jackson, 2010). Ackoff (1981) supports Churchman's idea that an improvement should be based on the perception of the stakeholders and what one considers as improvement may not be regarded as such by others. The interactive planning facilitates stakeholders' participation in systems design, which is important for getting commitment and consensus on the way forward (Mingers & White, 2010; Senge, 2006).

Ackoff (1981) challenges managers to view organisations as social systems serving different interests which include the organisation, employees and other stakeholders. He concedes that

it is important for managers to develop organisations that serve internal and external stakeholders without conflicts to be effective and viable. Ackoff (1981) notes that the old predict and prepare approaches do not have a place in modern organisations since the future cannot be predicted accurately in the changing environment. The interactive planning approach encourages the participation of all stakeholders in planning to ensure objectivity of a social system (Mingers & White, 2010; Senge, 2006; Midgley, 2006). Interactive planning has been credited for democratizing organisation structures, continuous learning and institutionalizing agreed objectives (Mingers & White, 2010; Senge, 2006). The participation of different stakeholders helps to have diverse worldviews in finding solutions to social systems like IT adoption in organisations (Bunker & Alban, 2006; Beer, 2004; Ho, 2014; Midgley, 2006).

Jackson (2003) criticizes interactive planning for underestimating challenges of conflicts between stakeholders in organisations based on different world views. The interpretive nature of interactive planning helps to get consensus and buy-in among stakeholders but the challenge is that it is of little help to coercive contexts where power and domination distort the social system (Mingers & White, 2010; Senge, 2006; Midgley, 2006). Interactive planning is therefore more suitable for pluralistic IT adoption problem contexts but not coercive contexts (Bunker & Alban, 2006; Beer, 2004; Ho, 2014; Midgley, 2006).

Interactive planning has been criticized for its assumption that community of interests among stakeholders always exists, which is necessary for free participation (Bunker & Alban, 2006; Beer, 2004; Ho, 2014; Midgley, 2006). Critics point out that a consensual social world does not always exist to allow free participation during IT adoption, which is important to interactive planning. In many cases the less fortunate stakeholders do not have an opportunity for their voices to be heard during debate as conflicts always exist in social systems like organisations, which are full of incompatible interest (Bunker & Alban, 2006; Beer, 2004; Ho, 2014; Midgley, 2006). The next sub-section discusses the soft system methodology with regard to IT adoption decision making in organisations.

### **2.9.2.3 Soft System Methodology**

The previous sub-section discussed the soft system methodology with regard to IT adoption decision making in organisations. Soft system methodology (SSM) is a soft systems approach suitable for ill-structured problem situations and helps to answer the, ‘what to do?’ questions and ‘how to do?’ questions (Midgley, 2006; Rohs & Navarro, 2008; Reynolds, 2014). Soft

system methodology has been used by both academics and practitioners to address information systems problems in organisations (Luoma, 2007; Van de Water, Schinkel & Rozier, 2007; Jackson, 2010). Soft system methodology helps problem situations where there are no agreed goals and objectives and where hard systems distort the problem situation and jump to premature conclusions. Soft system methodology provides an opportunity for individuals to express their worldviews as a process of finding alternative solutions to IT adoption problem situations. Human activity systems such as IT adoption in organisations need debates among participants to the problem situation as part of system intervention (Checkland, 2010).

Soft systems methodology, which embraces a paradigm of learning compared to optimization of hard systems approaches, is useful in establishing goals and objectives before the need for optimization to achieve efficiency and efficacy in organisations (Tawileh et al., 2006; Molineux & Haslett, 2007, Checkland, 2010). The SSM embraces different participant worldviews of reality and a learning process to establish solutions to IT adoption decision making in organisations. Soft systems methodology's interpretive nature is more suitable for social IT adoption problem situations than the functionalist approach of hard systems thinking (Midgley, 2006; Checkland & Poulter, 2006; Reynolds, 2014). Social systems such as organisations are mental constructs of observers based on their unique worldviews. The reason that stakeholders have different worldviews to IT adoption benefits makes it necessary for a structured debate to find one another.

Soft systems methodology helps to manage and structure debate on different worldviews among stakeholders to create shared perceptions and viewpoints during IT adoption decision making in organisations (Checkland & Poulter, 2006; Jackson, 2010). Soft systems methodology has been credited for helping to seek consensus and agreement on the way forward to a problem situation as it allows exploring the purpose (Checkland & Winter, 2006; Kayaga, 2008; Jackson, 2010). It assists decision makers to learn in order to challenge the existing worldview and come up with alternatives. Soft systems methodology therefore provides a means of clear understanding during IT adoption decision making in organisations (Checkland & Poulter, 2006; Checkland & Winter, 2006; Jackson, 2010).

Whilst soft systems methodology has been found suitable for pluralist problem situations with a need for shared perceptions, it has been criticized for failing to address conflict and coercive problem situations. Hard systems thinkers criticized soft systems methodology for failing to

address the ‘how to?’ of IT adoption in organisations which need prediction and control (Midgley, 2006; Checkland & Winter, 2006; Jackson, 2010). Soft systems methodology has been criticized for its assumption of a consensual worldview, downplaying the existence of conflicts and coercive problems in organisations. Soft systems methodology seems to ignore the power relations and conflicts that characterize the organisation social world (Jackson, 2003; Checkland & Winter, 2006; Kayaga, 2008; Jackson, 2010).

Whilst soft systems methodology considers the importance of participation; it does not have rules for genuine participation. The lack of genuine participation of soft systems methodology may constrain and distort the debate which will be dominated by the powerful individuals who will influence the outcome of the debate. Checkland (1983) however argues that the criticism of the existence of power relationships is unjustified as no systems approach may overthrow a tyranny. Whilst soft systems methodology has been credited for embracing the interpretive paradigm it has been criticized for too much subjectivism and being blind to other paradigms (Jackson, 2003; Ulrich, 2008; Kayaga, 2008; Jackson, 2010).

Some critics argue that soft systems methodology has a regulative nature inherited from an interpretive paradigm, which ignores the fact that the organisational social world is full of contradictions, conflicts of interest and coercion (Jackson, 2003; Reynolds & Ulrich, 2010). Mingers (1984) criticized soft systems methodology for ignoring organisational politics and structures hoping that changing people’s worldviews is the only important thing. The structures and politics are important as they determine and influence the worldviews during IT adoption in organisations. Soft systems methodology is seen as helpless in IT adoption situations dominated by power relations, coercion, discrimination and oppression (Jackson, 2003; Ulrich, 2007). The next section discusses the emancipatory systems approaches with regard to IT adoption decision making in organisations.

### **2.9.3 Emancipatory Systems Thinking Approaches**

The previous sections discussed soft systems thinking approaches with regard to IT adoption decision making in organisations. Emancipatory systems thinking was developed because of the failure of hard systems thinking approaches and soft systems thinking approaches to give appropriate attention to IT adoption problem situations of a coercive nature in organisations (Ulrich, 2003; Jackson, 2010; Reynolds, 2014). The emancipatory systems thinking approaches emphasize the emancipation and empowerment of discriminated stakeholders by the existing system in terms of the way they are treated (Ulrich, 2007; Slangen, 2013).



Emancipatory systems thinking's emphasis is on IT adoption problem situations which are perceived to have issues of power relations that affect decision making in organisations.

Emancipatory system thinking approaches provide a democratic IT adoption decision making which can be affected by the organisational power structures (Ulrich, 2008; Reynolds, 2012; Boltanski, 2011). Reynolds et al. (2010) say that "emancipatory systems thinking approaches are focused on improving real-world problem situations by revealing all forms of alienation and oppression in organisations". The assumption is that during IT adoption decision making there is discrimination of certain stakeholder groups in organisations (Ulrich, 2005; Jackson, 2010). The emancipatory systems thinking approaches help to reduce discrimination of stakeholders during IT adoption decision making in organisations as they empower oppressed stakeholders to achieve the emancipatory objective (Reynolds, 2008).

The emancipatory systems thinking approaches are suitable for coercive and political IT adoption problem contexts (Ulrich, 2006; Reynolds, 2011). Emancipatory systems thinking approaches focus on addressing issues of discrimination by empowering the marginalised stakeholders (Ulrich, 2003; Reynolds, 2007). Emancipatory systems thinking approaches regard organisations and society as full of conflict and coercion that affects proper participation of the affected stakeholders (Midgley, 2006; Boltanski, 2011). The next subsections discuss two examples of emancipatory systems thinking approaches which are: Critical Systems Heuristics (CSH) and Team Syntegrity.

### **2.9.3.1 Critical Systems Heuristics**

The previous section discussed the emancipatory systems approaches with regard to IT adoption decision making in organisations. Critical systems heuristics by Ulrich (1981) questions the beneficiary of IT adoption in organisations and seeks to empower those affected by the decision and involve them. Critical systems heuristics (CSH) challenges the existence of unfairness in organisations by promoting the participation of those affected by the decision (Reynolds et al., 2010). Critical systems heuristics' major emphasis is that decision on IT adoption in organisations should emanate from those affected by the changes. Critical systems heuristics has been credited for being able to interrogate other issues that were not revealed by other systems approaches. Ulrich (1983) highlights that hard system thinking approaches are ideal to deal with situations of how to do things (instrumental reason). Ulrich (1981) embraces Churchman's (1968) idea of drawing boundaries to determine the nature of improvement and action to be taken. Churchman (1971) argues that system interventions

need to sweep-in different stakeholder perceptions as part of drawing boundaries.

Critical systems heuristics has been credited for paying attention to the need to empower all stakeholders to participate in debate of the social systems such as IT adoption in organisations (Jackson, 2010; Reynolds & Ulrich, 2010). Critical systems heuristics promote the empowering of the often marginalised stakeholders to participate in IT adoption decision making. The CSH boundary concept has been seen as useful for drawing problem situation boundaries on what needs to be done and how it should be done. CSH challenges the decision maker to question whose interest is to be served by social systems of concern and gives attention to the affected and not involved during IT adoption in organisations (Jackson, 2010, Ulrich, 2005).

Critics have challenged critical systems heuristics for including materialist persuasions that give rise to particular beliefs and values (Jackson, 2000; Midgley, 2000). They argue that stakeholders' social positions in organisations have an influence on the ideas, beliefs and values that they hold. They added that organisational structures determine particular dominant ideologies at particular times. Critical systems heuristics has been criticized for ignoring the structural aspect of social systems such as organisations (Jackson, 2010; Ulrich, 2001). Other critics question why the involved would bother about interests of the affected but not involved and its success depends on the existence of an environment for debate between the different stakeholders (Midgley, 2007; Reynolds, 2008). Critical systems heuristics' weakness has been cited as its lack of developed social theory to enforce genuine emancipation in organisations and society that inhibit participative and rational decision making (Reynolds, 2014).

Critical systems heuristics' lack of society theory is a limitation on where the boundaries of a social system design should be drawn (Jackson, 2003). The challenge of critical systems heuristics has been that it is not easy for users and may be used to reinforce certain stakeholders' worldviews. Critical systems heuristics has been criticized for being immature due to a lack of well-tried methods like other systems approaches which serve instrumental reason (Jackson, 2003). In that regard critical systems heuristics is more suitable to be used with other established systems approaches from a functionalist paradigm. Its weakness has been to manage complexity that dominates the hard systems approaches and more complex coercive problem situations (Ulrich, 2010). Critical systems heuristics is criticized for paying less attention to social structures that influence the outcome of debate in organisations

(Jackson, 2003; Reynolds, 2014). The next sub-section discusses the team synteegrity with regard to IT adoption decision making in organisations.

### **2.9.3.2 Team Synteegrity**

The previous sub-section discussed the critical systems heuristics regard to IT adoption decision making in organisations. Team synteegrity's emphasis is on democratizing the decision making process in social systems by debating and getting commitment from different stakeholders on action to be taken on problem situations (Malik, 2001; Espinosa & Harnden, 2007; Jackson, 2010). Team synteegrity supports and promotes inclusiveness through democracy and decentralization of power, flatter structures and self-management. Beer (1994) notes that organisational structures are a major constraint of debate during IT adoption decision making because of associated power structures. Team synteegrity is important to develop and accommodate divergent and conflicting viewpoints among different stakeholders in order to reach a shared social consciousness based on a variety of viewpoints (Espinosa & Harnden, 2007; Mingers & White, 2010; Jackson, 2010).

Team synteegrity is important at the initial stages of IT adoption problem situations to help achieve a better understanding about issues or matters of concern in organisations. Team synteegrity has been credited for addressing issues of coercion which are often ignored by other systems approaches. As an emancipatory approach, team synteegrity promotes democratic IT adoption decision making in organisations by establishing participating rules and ensuring democratic dialogue (Malik, 2001; Mingers & White, 2010; Jackson, 2010). Espinosa & Harnden (2007) highlight that team synteegrity promotes democratic participation of stakeholders during IT adoption in organisations. The democratic dialogue ensures accommodation of multiple viewpoints and reaching agreement on IT adoption among stakeholders on matters of concern.

Critics argue that team synteegrity's success in democratic IT adoption decision making does not guarantee the good intentions will be implemented successfully as they may be affected by structures and power relationships in organisations (Jackson, 2003; Espinosa & Harnden, 2007). This shortcoming may be addressed by combining it with hard systems thinking approaches. Espinosa & Mejia (2003) highlight that while team synteegrity promotes democratic IT adoption decision making, it does not have a hand in the conversation content that takes place. The content-less nature of team synteegrity does not guarantee the recognition of emancipatory concerns which are endemic in organisations during IT adoption (Mingers &

White, 2010; Espinosa & Harnden, 2007).

Some researchers concede the past distorted forms of knowledge may be imposed and legitimized as part of democratic dialogue in organisations (Espinosa & Mejia, 2003; Espinosa & Harnden, 2007). Team synteegrity has been criticized for assuming that participants are always willing to participate in a dialogue to reach consensus on IT adoption, therefore ignoring the power struggles associated with debates as each participant tries to defeat their opponents (Espinosa & Harnden, 2007). Team synteegrity was developed to complement other systems approaches such as VSM as the combination offers the best possible outcome to IT adoption problem situations in organisations (Espinosa & Harnden, 2007; Espinosa, Harnden and Walker, 2008). The next section discusses the critical systems thinking approaches with regard to IT adoption decision making in organisations.

#### **2.9.4 Critical Systems Thinking Approaches**

The previous section discussed emancipatory systems thinking approaches with regard to IT adoption decision making in organisations. Jackson (2010) defines critical systems thinking (CST) as the commitment to use different systems approaches, their related methodologies and methods together in system intervention. Jackson (2003) also uses the phrase ‘creative holism’ to refer to critical systems thinking approaches as they encourages the creative use of a combination of systems approaches. The critical systems thinking approaches focus on five commitments: critical awareness, social awareness, emancipation, theoretical pluralism and methodological pluralism. One of the benefits from critical systems thinking is the complementary strengths of social theory and systems thinking during IT adoption decision making in organisations (Midgley, 2011; Jackson, 2010; Reynolds, 2011).

Many challenges facing organisations, owing to the diverse nature of the operations, may require to be confronted with more than a single systems approach (Mejia, 2002; Cabrera et al., 2008; Reynolds, 2012; Jackson, 2010; Ulrich, 2011). This may be the case when issues to be addressed include those of emancipation, empowerment, emotion, pluralism, efficiency and efficacy. The trans-disciplinary nature of CST allows the use of different approaches, methodologies and methods in a single complex IT adoption problem situation (Jackson, 2010; Reynolds & Ulrich, 2010; Reynolds, 2014). The critical systems thinking approaches were developed after realisation of the weaknesses and strengths of individual approaches and the need for pluralist approaches. Pluralism encourages looking at problem situations from different perspectives and the use of different systems methodologies in combination

(Jackson, 2010; Reynolds & Ulrich, 2010). The multiple approaches to a problem situation help to get better appreciation of the problem situation than a single approach.

The SOSM (see Figure 2.6) has shown that different systems approaches were not in competition but could actually complement each other's weakness during IT adoption decision making in organisations (section 2.9). The diversity of approaches each addressing particular problem situation was not a crisis but an advantage in the ability to address a variety of IT adoption problem contexts in organisations. The pragmatist's point of view notes that it is important to select methods based on what works to address problem situation. Pluralism appreciates the strengths of different methodologies and suggests situations they may be used together (Jackson, 2010; Reynolds & Ulrich, 2010).

Ulrich (2007) contends that critical systems thinking approaches are suitable for addressing technical (how), social (what) and political (why) complex problem situations in organisations. Reynolds & Ulrich, (2010) argue that systems approaches are only a partial representation of the whole problem situation. Reynolds and Holwell (2010) highlight that critical systems thinking approaches address the inadequacies of hard and soft systems thinking by considering issues of power relations in systems interventions. The critical systems thinking assumption is that the combination of different system approaches is important to address their weakness to systems interventions (Jackson, 2010; Mingers & White, 2010; Houston et al., 2008).

The critical systems thinking approaches' perspective of organisations is that they are too complex to understand using any one approach and disagrees on claims of guaranteed generalized improvement and encourages the surfacing of suppressed viewpoints. Jackson (2010:136) highlights that "Critical systems thinking accepts hard systems thinking (based on positivism) as an equal partner to soft systems thinking (based on interpretivism), as well as encouraging the extension of applied systems thinking into the domains of emancipatory and postmodern paradigms". Critical systems thinking addresses the weaknesses of hard systems thinking and soft systems thinking, using social theories with commitment to critique, emancipation and pluralism. Critical systems thinking approaches help stakeholders in organisations to design a better human social system by exploring alternative designs (Jackson, 2010; Cordoba, 2009; Mingers, 2007; Houston et al., 2008).

Critical systems thinking approaches, embrace diverse interests, values and empower

stakeholders by having them participate in IT adoption decision making (Jackson, 2011; Reynolds, 2014). According to Jackson (2010:138) “critical systems researchers do not claim to know the answer in advance or peddle the same solution to all problems in all circumstances”. In addition, he concedes that “if management scientist[s] are genuinely to become competent in analyzing complex problems and intervening to resolve them, then the road marked out by critical systems thinking and practice is the one on which our discipline must progress” (Jackson, 2010:138).

Critical systems thinking approaches’ assumption is that change in organisations should not only be treated as shifting individual perspectives but also changing the individual knowledge matrix (Jackson, 2010; Cordoba, 2009; Mingers, 2007). Critical systems thinking approaches are suitable to handle stakeholder diversity during IT adoption decision making in a complex organisation environment. Critical systems thinking approaches are therefore an answer to challenges of restricting diversity and creativity by the other systems. Some critics are however skeptical about critical systems approaches’ value to managers as they are mostly occupied with issues of efficiency, effectiveness and consensus, which are of greater importance to most organisations than diversity issues (Jackson, 2010; Cordoba, 2009; Mingers, 2007). It has been criticized for being too irrational and for promoting anarchy in organisations. The next sub-sections discuss critical systems thinking approaches (Total systems intervention and critical systems practice) with regard to IT adoption decision making in organisations.

#### **2.9.4.1 Total Systems Intervention**

The next section discussed critical systems thinking with regard to IT adoption decision making in organisations. Total systems intervention (TSI) is defined as a meta-methodology that was developed to encourage the combination of methodologies to confront complex problem in a social system (Jackson, 2003; Ulrich, 2003; Houston et al., 2008; Raza & Standing, 2010; Petrovic, 2012). Total systems intervention commitments are social awareness, critical awareness, methodology pluralism, emancipation and pluralism at the theoretical level. TSI uses Habermas’ (1970) theory of three human interests (technical, practical and emancipatory) to represent the different systems approaches.

The technical interest is represented by the hard systems thinking with emphasis on efficiency and efficacy during IT adoption decision making in organisations (Jackson, 2010; Houston et al., 2008; Raza & Standing, 2010; Petrovic, 2012). The practical interest is represented by the

soft systems thinking with emphasis on pluralism of worldviews during IT adoption decision making in organisations. The emancipatory interest is represented by the emancipatory systems thinking with emphasis on empowerment and emancipation during IT adoption decision making in organisations (Jackson, 2010; Houston et al., 2008; Raza & Standing, 2010; Petrovic, 2012).

The human interest analysis is important to appreciate the assumption behind each approach including strengths and weaknesses (Mejia, 2001; Jackson, 2010; Ulrich, 2010). The critical awareness is important to understand social contexts suitable for different systems approaches. Although pluralism focuses at the theoretical level it has faced criticism from those in support of paradigm incommensurability (Toscano, 2006; Jackson, 2010; Raza & Standing, 2010). Paradigm incommensurability assumptions are that it is inconceivable that different systems methodologies can be used together in any complementary way. Critical systems thinkers legitimized pluralism using Habermas' (1970) theory of human interests (technical, practical and emancipatory) from its critics and supporters of paradigm incommensurability (Jackson, 2010; Ulrich, 2010; Reynolds, 2014). The use of different methods to deal with complex IT adoption problem situations puts total systems intervention ahead of other systems approaches (Szostak, 2007; Jackson, 2010; Reynolds & Ulrich, 2010). Total systems intervention does not support pragmatism, like critical systems practice, as it argues that it is impossible and prefers dominant and dependent methodology during intervention to problem situations in organisations (Mejia, 2001; Jackson, 2010; Reynolds & Ulrich, 2010). The next section discusses critical systems practice with regard to IT adoption decision making in organisations

#### **2.9.4.2 Critical Systems Practice**

The previous sub-section discussed total systems intervention with regard to IT adoption decision making in organisations. Critical systems practice (CSP) is defined as meta-methodology for critical systems thinking (CST) theory (Jackson, 2003). The CSP development was encouraged by the popularity of pluralism in methods in other disciplines such as evaluation research, and organisation theory (Jackson, 2011; Reynolds, 2014). The interest in multi-methodology resulted in a community of those interested in critical system thinking. Jackson (2006) says "instead of the five commitments of critical systems thinking, critical systems practice has three commitments: critical awareness, improvement and pluralism". The critical awareness commitment placed emphasis on the critique of strengths and weaknesses of various methodologies to IT adoption problem situations (Jackson, 2011;

Reynolds, 2014).

The improvement commitment has emphasis on promoting fairness, empowerment and emancipation as part of improvement. The improvement commitment challenges the generalization of improvement and preferred the term “local improvement” (Jackson, 2010). The pluralism commitment encourages the use of different methods, methodologies and theories in combination to address complex IT adoption problem situations in organisations. The CSP accepts pragmatism in that its use delivers greater benefits than a single paradigm and that different methodologies can be used based on the nature of intervention to the problem situation (Jackson, 2006; Jackson, 2011; Reynolds, 2014). Critical systems practice supports that methodologies based on different paradigms can be used in one intervention to resolve IT adoption problem situations in organisations. In addition it accepts the use of part of different methodologies to the same problem situation in combination (Jackson, 2006; Jackson, 2011; Reynolds, 2014).

The mix and match method approach allows maximum freedom to address IT adoption problem situations without a restriction on tools available (Jackson, 2006; Jackson, 2011; Reynolds, 2014). While CSP supports unrestricted multi-methods use it demands explicit recognition of the paradigms the methods are being used to serve and has been credited with being able to handle complex IT adoption problem situations in organisations that may require more than one system approach to resolve (Jackson, 2006; Jackson, 2011; Reynolds, 2014). It affords the use of a wider variety of tools in combination to respond to complex IT adoption problem situations in organisations as in certain situations there may be a need to use hard and soft systems thinking approaches to resolve the problem situation.

CSP reduces the different systems methodologies to four types and allows the accessing of various methods and tools to address IT adoption problem situations in organisations (Jackson, 2006; Jackson, 2011; Reynolds, 2014). CSP has the opportunity of being able to handle complex and different IT adoption problem situations in organisations which are associated with all other system approaches in single intervention (Jackson, 2003). With modern organisations facing complex IT adoption problem situations CSP can provide a holistic perspective through use of different systems approaches. Most IT adoption problems may not be understood, let alone solved, using a single system approach. The use of more than one approach is seen as an advantage as they will complement each other’s strengths (Jackson, 2006; Jackson, 2011; Reynolds, 2014).



Critics argue that the requirement to change from one conflicting paradigm to another may present a challenge to users. Midgley (2000) concurs that at times the easy solution is that one paradigm is always favoured. The other challenge to CSP is ethical choices because of its holistic nature. Whilst it can be acknowledged that CSP seems difficult to use, it must also be accepted that organisation problem situations such as IT adoption are becoming more complex and diverse, which cannot be addressed by simple solutions (Jackson, 2003; Jackson, 2006; Jackson, 2011; Reynolds, 2014). The next section discusses summarises systems approaches with regard to IT adoption decision making in organisations.

### **2.9.5 Systems Approaches Summary**

The previous sub-section discussed the critical systems practice with regard to IT adoption decision making in organisations. The hard systems thinking approaches have been found useful in addressing problem situations with agreed objectives and limited to address IT adoption problem situations of a pluralistic nature. The soft systems thinking approaches have been found useful to address subjective problem situations and with limitations in coercive environments. The emancipatory systems approach has been found suitable in addressing IT adoption problem situations with conflicts and coercive environment. Lastly critical systems thinking has been found suitable to address problem situations where one approach may be insufficient as it supports the use of more than one approach to a single problem situation. Having discussed the literature review on IT adoption models and frameworks, the next section presents a discussion of the chapter on literature that informs the proposed IT adoption governance framework.

### **2.10 Discussion**

The study objectives were to develop and validate a proposed IT adoption governance framework to assist with organisations with IT adoption decision making. The chapter acknowledged the challenge of IT adoption decision making from an organisation's perspective. This study tried to address the challenges of current frameworks by developing an IT adoption governance framework to assist organisations with IT adoption decision making. The literature review in this chapter was therefore important to provide a theoretical framework important to the development of an improved IT adoption governance framework. The literature review discussed several theories related to IT adoption which were important to the development of the preliminary high level IT adoption governance framework. The literature review noted the complexity of IT adoption in organisations and suggested a

combination of independent frameworks in developing an integrated framework to address the shortcomings of existing models and frameworks. The theories that were discussed in this chapter were important in informing the preliminary framework

The literature review findings in this chapter helped to inform the preliminary IT adoption governance framework to assist organisations with IT adoption decision making. The findings were also important to answer the research question. The chapter helped to address the research question as it provided literature on shortcomings of current models and frameworks for IT adoption in organisations. In addition to that the chapter provided some deep insight into the strengths and weaknesses of current models and frameworks to the challenge of IT adoption decision making in organisations. The literature also helped in understanding the challenges of IT adoption from an organisation's perspective rather than an individual's perspective.

Furthermore, the chapter helped to address the sub-question: How can the current IT adoption decision models and frameworks be improved to assist organisations with IT adoption decision making? The literature review was useful in informing how current models and frameworks can be improved as it provided insights important for the development of the preliminary IT adoption governance framework. Having stated the relevance of literature review to this study, the next section concludes the literature review chapter.

## **2.11 Conclusion**

This chapter argued the case that IT adoption decision making is a complex endeavour which requires a multi-disciplinary approach. While traditional approaches based on a simplistic lens of reductionism were successful in addressing simpler problem situations, they are not suitable for addressing highly complex problem situations associated with IT adoption decision making. The chapter showed that a single approach does not fit all problem situations, highlighting the need for a multi-approach to complex problem situations. The diversity of systems approaches therefore should not be seen as a crisis, but a realization that different problem situations require different methodologies. With regard to the development of the preliminary IT adoption governance framework, this study was guided by the following argument:

There is no one-size-fits-all approach to IT adoption decision making in organisations as each problem context is unique and needs to be

viewed from different worldview from the previous one. Based on this argument, it is therefore important to view the context of IT adoption problems from different sociological paradigms to be able to select appropriate approaches to the problem situation at hand rather than assume that previous solutions will always work to new problem context. While there is a lot of literature on IT adoption in organisations, very few if any of the studies focus on IT adoption in organisations with more emphasis in addressing challenges of different stakeholder worldviews.

This study therefore tried to address that gap by developing an IT adoption governance framework that focuses on IT adoption decision making in organisations. Although by no means exhaustive, the literature exposed some gaps in the research area of IT adoption decision making in organisations. In addition, the literature acts as a stimulus for further research on this complex phenomenon. The literature review helped to justify why current frameworks need improvement in assisting IT adoption decision making in organisations. This chapter was therefore important to gain deep understanding of the current frameworks before proposing an improved IT adoption governance framework. In summary the chapter was important in informing the development of the proposed framework as part of answering the research question. Table 2.2 presents the summary of the advantages and disadvantages of current frameworks to IT adoption decision making in organisations. The next chapter discusses the proposed improved IT adoption governance framework to assist organisations with IT adoption decision making.

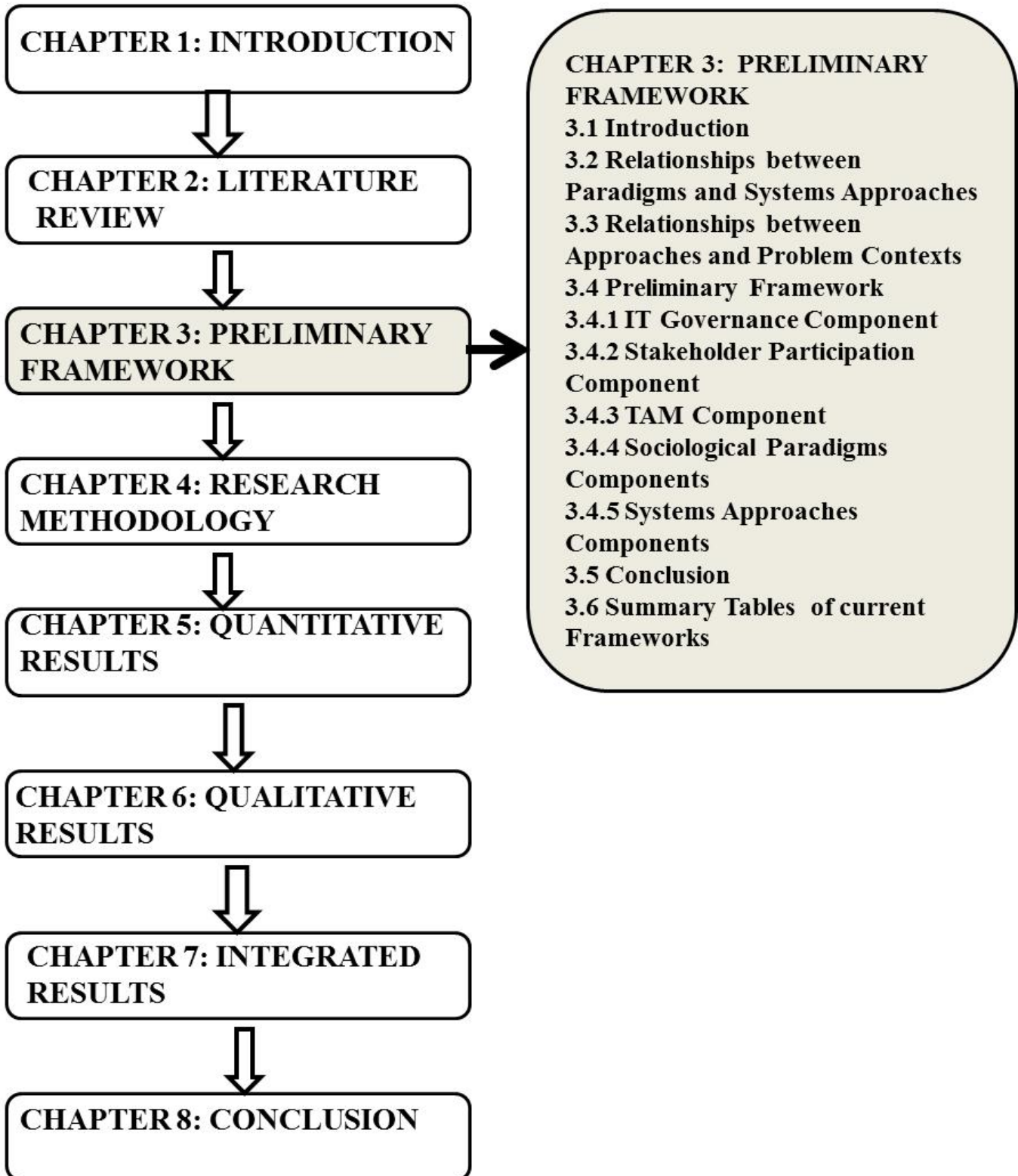
## 2.11 Summary Tables of existing Frameworks

Table 2.2: Summary of existing frameworks

Framework /Model/ Approach	Authors	Advantages/Challenges	Framework /Model/ Approach Components
TAM Model	Davis (1989)  Du Plooy (1998)  Weilbach & Byrne (2010)	<u><b>Advantages</b></u> -Provide insight on -individual behaviour <u><b>Challenges</b></u> -Deterministic approach -Technical oriented -Ignore artefacts design -Suitable for individual behaviour -Ignores social context -Not suitable for organisation context	Perceived Usefulness Perceived Ease of Use

IT Governance Framework	Holick et al. (2005) Kim et al. (2009) Ven et al. (2008) Weill (2004) Weill et al (2005)	<b><u>Advantages</u></b> -Align IT to business -Provide IT Value Delivery -Reduce Risk to IT -Manages IT Resources -Measure IT Performance <b><u>Challenges</u></b> -Uses top down approach -Uses positivist approach	-Strategic Alignment -Value Delivery -Risk Management -Resource Management -Performance Measure
Stakeholder Approach	Cordoba (2009) Freeman (1984)	<b><u>Advantages</u></b> -help to identify stakeholders -Promote stakeholder engagement -Improves communication <b><u>Challenges</u></b> -No suitable for implementation -Does not address areas of conflict	Stakeholder Analysis
Hard Systems Approaches	Jackson (2003)	<b><u>Advantages</u></b> -Suitable for improving efficiency -Good at implement projects with clear objectives <b><u>Challenges</u></b> -Limited at simple problem situations -Understand problem based on individual parts -Fail to appreciate social context -Treat IT adoption as deterministic -Assumes stakeholder consensus	-Operations research -Viable system model -Systems Analysis -System Dynamics -Organisational Cybernetics -Complexity Theory
Soft Systems Approaches	Checkland (1990)	<b><u>Advantages</u></b> -Promote stakeholder engagement -Accommodate divergence stakeholder interest -Analyze stakeholder perspective -Focus on end user not technology -Shift focus to social issues <b><u>Challenges</u></b> -Does not address conflict	-Soft Systems Methodology -Strategic Assumption Surfacing and Testing -Interactive Planning
Emancipatory Systems Approaches	Ulrich (2001)	<b><u>Advantages</u></b> -Addresses areas of conflict -Empowers disadvantaged stakeholder -Avoids discriminations of stakeholders -Ensures genuine participation stakeholders <b><u>Challenges</u></b> Lacks theoretical and methodology pluralism	-Critical Systems Heuristics -Team Syntegrity
Critical Systems Approaches	Jackson (2003)	<b><u>Advantages</u></b> -Supports methodology pluralism -Support critical awareness of methodologies -Promote rigour problem situation -Supports multi-methodology <b><u>Challenges</u></b> Difficult to put into practice	-Critical Systems Practice -Total Systems Intervention -System of systems methodologies

## CHAPTER 3: DIAGRAMMATIC OVERVIEW



## **CHAPTER 3: PRELIMINARY FRAMEWORK**

### **3.1 Introduction**

The previous chapter discussed the literature on IT adoption decision making in organisations and also highlighted some of the limitations of the existing frameworks. The previous chapter discussion also pointed to the fact that IT adoption decision making in organisations is a complex phenomenon. IT adoption decision making requires an interdisciplinary approach to understand the socio-technical, political, economic and legal challenges. The one-size-fits-all approach is fundamentally flawed to IT adoption decision making in organisations as it is both subjective and contextual. In this chapter an improved IT adoption governance framework is proposed that balances the needs of understanding hard (objective) and soft (subjective) problem situations associated with IT adoption decision making in organisations.

The preliminary IT adoption governance framework assumption is that a one-size-fits-all approach has shortcomings for complex phenomena such as IT adoption decision making in organisations. This chapter is organised as follows: section 3.1 discusses the relationship between sociological paradigms and systems approaches, section 3.2 discusses the relationship between systems approaches and problem context, section 3.3 proposes the IT adoption governance framework, section 3.4 discusses the preliminary framework and finally section 3.5 presents the conclusion of the chapter. The next section discusses the relationship between systems approaches and the sociological paradigms.

### **3.2 Relationship between Sociological Paradigms and Systems Approaches**

According to Burrell and Morgan (1979) the most common social theory paradigms are functionalist, interpretive, radical structuralist and radical humanist. Most researchers concur that there is relationship between systems approaches and sociological paradigms (Reynolds & Ulrich, 2010). The sociological paradigms are aligned to particular systems approaches as shown in Figure 3.1. The next sub-section discusses the relationship between a functionalist paradigm and hard systems thinking approaches.

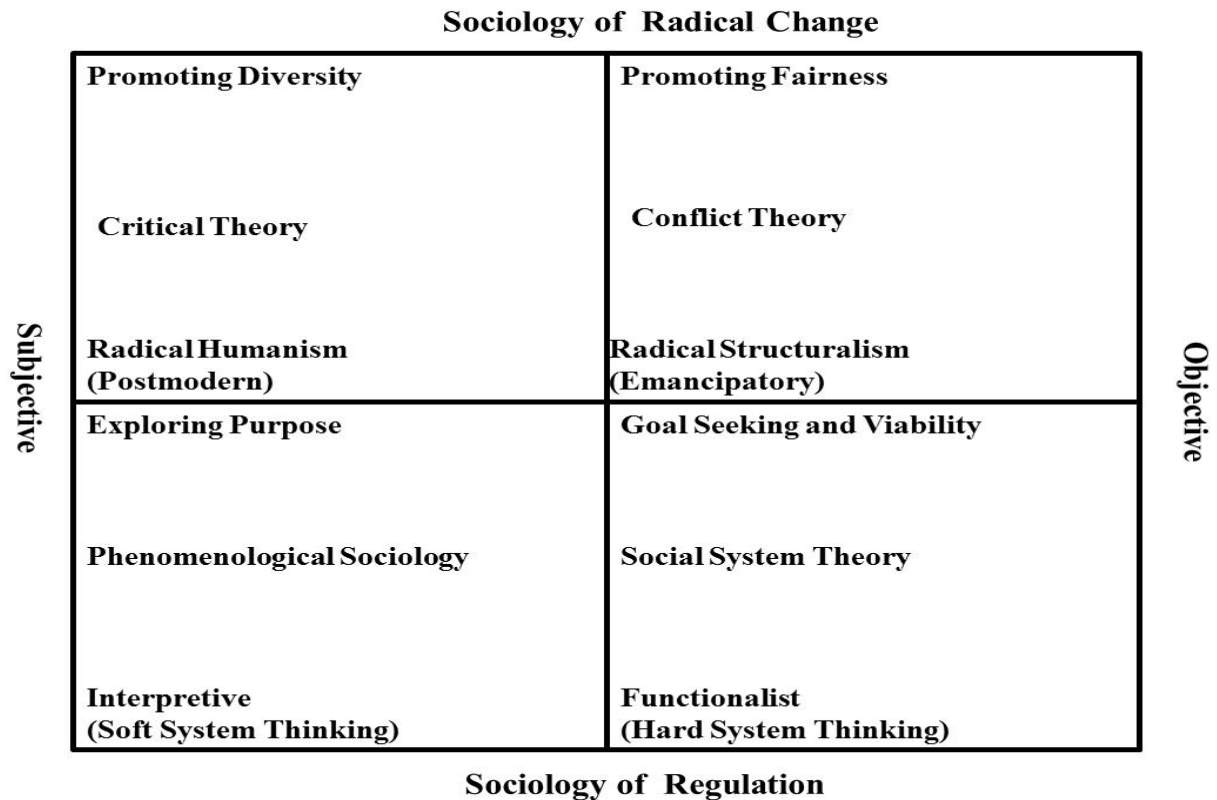


Figure 3.1: Relationship between Sociological Paradigms and Systems Approaches (Adapted from Burrell & Morgan, 1979)

### 3.2.1 Functionalist Paradigm (Hard Systems Thinking)

The hard systems thinking approach using Burrell and Morgan's (1979) framework of sociological paradigms (Figure 3.1) is situated in the functionalist paradigm since its guiding assumptions are objective and regulation (Jackson, 2003; Reynolds & Holwell, 2010; Urick, 2012; Hassan, 2013). Functionalist paradigm's emphasis is to promote and ensure that organisations are adaptive, efficient and effective (see sections 2.8.1 & 2.9.1). The functionalist paradigm relies on scientific methods to achieve its objectives of eliminating inefficiency and disorder in organisations (Rosenhead, 2009; Babintsev & Sapryka, 2013).

### 3.2.2 Interpretive Paradigm (Soft Systems Thinking)

The soft systems thinking approach using Burrell and Morgan's (1979) framework, (Figure 3.1), is situated within the interpretive paradigm since its guiding assumption is subjective and regulation (Jackson, 2003; Cronje, 2011; Reynolds, 2014). The interpretive paradigm and systems thinking approaches' assumptions are that organisations as social systems are a result

of people's interpretation of the nature of its purpose (see sections 2.8.2 & 2.9.2). The interpretive paradigm supports subjectivity since different stakeholders have different meanings for the purpose of the social system (Hassan, 2013; Ho, 2014). Interpretive paradigms and soft systems thinking encourage stakeholder participation and involvement to gain their commitment (Cordoba, 2009; Jackson, 2010; Reynolds & Ulrich, 2010).

### **3.2.3 Radical Structuralist Paradigm (Emancipatory Systems Thinking)**

Emancipatory systems thinking using Burrell and Morgan's (1979) framework, (Figure 3.1), is situated within the radical structural paradigm since its guiding assumptions are objective and radical change (see sections 2.8.3 & section 2.9.3). The radical structuralist paradigm's assumption is that there are oppressed groups in organisations and society. The emancipatory systems thinking approaches which are based on the radical structural paradigm focuses on three commitments: critical awareness, social awareness and emancipation (Jackson, 2010; Reynolds & Ulrich, 2010; Reynolds, 2014). Its emphasis is on emancipating the oppressed by revealing all forms of power domination and encouraging reforms to the current social order. The discrimination can be based on sex, age; race, class and status (see sections 2.8.3 & section 2.9.3).

### **3.2.4 Radical Humanist Paradigm (Critical Systems Thinking)**

Critical systems thinking using Burrell and Morgan's (1979) framework, (Figure 3.1), is situated within the radical humanist paradigm since its guiding assumption are subjective and radical change (see sections 2.8.4 & section 2.9.4). The radical humanist paradigm's assumption (perspective) is that modern organisation and society problem situations are too complex to be understood using one paradigm (Jackson, 2010; Whittington, 2013; Venable, 2011). It challenges the idea of guaranteed improvement to intervention to problem situations and encourages diversity of paradigms (Midgley, 2011; Reynolds, 2014). Critical systems thinking approaches provide an alternative way to encourage different methodologies to explore the IT adoption problem situation (Mingers, 2007; Cordoba, 2009; Mingers & White, 2010). In addition to promoting pluralism of methodologies, they promote the use of complementary methodologies in addressing complex IT adoption problem situations in organisations (see sections 2.8.4 & 2.9.4).

This sub-section discussed the relationships between sociological paradigms and systems approaches. Sociological paradigms as worldviews are associated with systems approaches



when intervening to IT adoption problem situations in organisations. Understanding of the relationships between sociological paradigms and systems approaches is important in the development of the preliminary IT adoption governance framework to assist organisations with IT adoption decision making. The next section discusses the relationship between systems approaches and problem context.

### 3.3 Relationship between Systems Approaches and Problem Context

The previous section discussed the relationships between sociological paradigms and systems approaches. This section discusses the relationship between systems approaches and IT adoption problem context in organisations. The next sub-section discusses the hard systems thinking problem context.

Participants dimension of contexts (increasing diversity of values) →			
Systems dimension of contexts (increasing complexity) ↓			
	Unitary Hard Systems Approaches	Pluralist Soft Systems Approaches	Coercive Emancipatory Systems Approaches
	<b>Simple-unitary problem contexts</b> •Operations research (OR) •Systems engineering (SE) •Systems analysis (SA)  <i>•Suitable for simple IT adoption issues of technical nature with agreed objectives</i>	<b>Simple-pluralist problem contexts</b> •Strategic assumption surfacing and testing (SAST)  <i>•Suitable for simple plural IT adoption issues of social nature with no agreed objectives</i>	<b>Simple-coercive problem contexts</b> •Critical systems heuristics  <i>•Suitable for simple social and coercive IT adoption issues with no complex relationships</i>
	<b>Complex-unitary problem contexts</b> •System dynamics •Organizational cybernetics •Complexity theory  <i>•Suitable for complex IT adoption issues of technical nature with agreed objectives</i>	<b>Complex-pluralist problem contexts</b> •Interactive planning •Soft system methodology  <i>•Suitable for complex plural IT adoption issues of social nature with no coercive relationships</i>	<b>Complex-coercive problem contexts</b> •Critical systems approaches •Total system intervention  <i>•Suitable for complex IT adoption issues with technical, practical and emancipatory interests</i>

Figure 3.2: Relationship between Systems Approaches and IT Adoption Context (Source: Adapted from Jokonya, 2013)

#### 3.3.1 Hard Systems Thinking Approaches – Objective Problem Context

The previous section discussed the relationships between sociological paradigms and systems approaches. This sub-section discusses the relationship between systems approaches and IT adoption problem context in organisations. Based on Figure 3.2, hard systems thinking approaches are more appropriate for understanding simple unitary and complex unitary IT adoption problem situations in organisations (see section 2.9.1). Hard systems thinking approaches allow IT adoption decision making problem situations with clear objectives to be placed at centre stage (see section 2.9.1). Most of the problem situations suitable for hard

systems thinking approaches have clear objectives with the main aim being how to achieve those objectives (Reynolds & Ulrich, 2010; Jackson, 2010).

Hard systems thinking approaches rely on the use of mathematical models for their success to solve IT adoption problem situations in organisations (see section 2.9.1). The hard systems thinking approaches' measures of success are based on efficiency and effectiveness of the system of concerned. The hard systems thinking approaches have more emphasis on planning and control as a means of realizing the IT adoption benefits. Hard systems thinking approaches are not suitable at handling complex pluralistic IT adoption problem situations as they distort the reality of a social perspective (see section 2.9.1).

### **3.3.2 Soft Systems Thinking Approaches – Subjective Problem Context**

Based on Figure 3.2, soft systems thinking approaches are more appropriate for understanding subjective IT adoption problem context in organisations (see section 2.9.2). Soft systems thinking approaches allow subjective IT adoption decision making problem situations to be placed at centre stage (Reynolds & Ulrich, 2010; Jackson, 2010). Soft systems thinking approaches are appropriate for addressing subjective IT adoption problem situations where stakeholders have different worldviews about the nature of the benefits to the organisation (see section 2.9.2). Soft systems thinking approaches help to bring consensus on subjective issues during IT adoption decision making in organisations.

The subjective IT adoption issues in organisations are now always simple to understand using the cause and effect relationship of hard systems thinking approaches. Soft systems thinking approaches are more suitable for understanding multiple stakeholder perspectives of social issues of IT adoption (Cordoba, 2009; Reynolds, 2012). Soft systems thinking approaches encourage constructive debate and accommodate social factors such as values, beliefs and feelings about the nature of improvement of IT adoption in organisations (Reynolds & Ulrich, 2010; Reynolds, 2012). However, the weakness of soft systems thinking approaches is their failure to address situations with conflicts and coercive relationships (see section 2.9.2).

### **3.3.3 Emancipatory Systems Thinking Approaches – Coercive Problem Context**

Based on Figure 3.2, the emancipatory systems thinking approaches are more appropriate for understanding simple coercive and conflicts issues in IT adoption problem context in

organisations (see section 2.9.3). Emancipatory systems thinking approaches allow conflicts and coercive issues to be placed at the centre stage during IT adoption decision making in organisations (Jackson, 2010; Reynolds & Ulrich, 2010). The emancipatory systems thinking approaches are useful for addressing conflicts during IT adoption decision making in organisations (Reynolds, 2014).

The emancipatory systems thinking approaches are based on the assumption of the existence of different forms of oppression in organisations during IT adoption (Jackson, 2010; Reynolds & Ulrich, 2010). The emancipatory systems thinking approaches allow questions to be asked about the beneficiary of IT adoption in organisations and to seek to empower those affected by the IT adoption decisions in organisations (see section 2.9.3). The emancipatory systems thinking approaches allow for democratic debate on IT adoption decision making issues in organisations (Cordoba, 2009; Jackson, 2010; Reynolds, 2014).

#### **3.3.4 Critical Systems Thinking Approaches – Complex Problem Context**

Based on Figure 3.2, the critical systems thinking approaches are more appropriate for understanding IT adoption complex problem contexts which are objective, subjective and coercive in nature (section 2.9.4). Critical systems thinking approaches allow objective, subjective and coercive IT adoption problem contexts to be placed at centre stage during IT adoption decision making in organisations (Reynolds & Ulrich, 2010). Critical systems thinking approaches are useful for addressing IT problem situations which have technical, social and emancipatory interest in organisations (Cordoba, 2009; Jackson, 2010; Reynolds, 2014).

Technical interests in IT adoption problem contexts are useful to achieve objectives in organisations through predicting and controlling (Jackson, 2010). Technical management competencies are therefore important to address the technical issues (section 2.9.4). The social interests are based on the subjective nature of the organisational social world where IT adoption issues needs to be agreed upon by the affected and involved (Reynolds & Ulrich, 2010). The emancipatory interest during IT adoption decision making in organisations seeks insight into power structures and hidden sources of oppression. Critical systems thinking approaches criticize all forms of oppression during IT adoption decision making in organisations (Jackson, 2010). In summary this section discussed systems approaches that can be mapped to problem contexts during IT adoption decision making in organisations. The

next section proposes the improved IT adoption governance framework to assist organisation with IT adoption decision making.

### 3.4 Preliminary IT Adoption Governance Framework

The previous section discussed the relationships between systems approaches and IT adoption problem contexts in organisations. The assumption of the systems approaches is that there is a fit between a systems approach and IT adoption problem situations in organisations (section 2.9). The previous section contends that each systems approach is suitable for a particular IT adoption problem context in organisations. This section proposes the IT adoption governance framework to assist IT adoption decision making in an organisations. The preliminary framework is based on the integration of some of the existing frameworks that were discussed in the previous chapter.

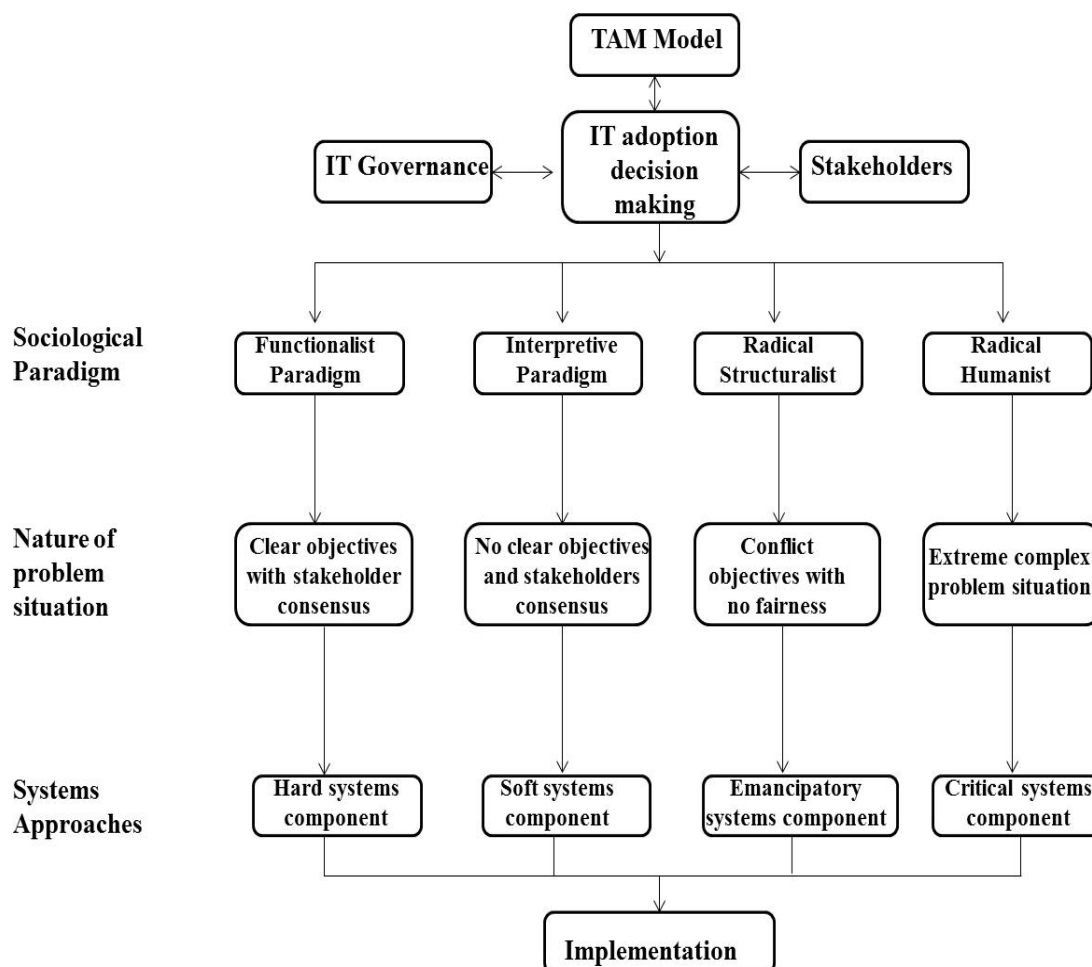


Figure 3.3: IT Adoption Governance Framework (Adapted from Jokonya et al. 2012)

Figure 3.3 illustrates the components of the preliminary IT adoption governance framework in relations to IT adoption decision making in organisations. The preliminary IT adoption governance framework is made up of five main integrated components. These are: *IT Governance*, *Stakeholder Participation*, *Technology Acceptance Model*, *Sociological Paradigms* and *Systems Approaches*. The preliminary IT adoption governance framework assumes that there is no single approach suitable for all IT adoption problem contexts in organisations. In addition, the preliminary IT adoption governance framework accepts that various stakeholders have different worldviews in terms of IT adoption benefits in organisations. It is therefore necessary to explore IT adoption problem contexts using various sociological paradigms to determine the most suitable systems approach for a given problem situation.

It is anticipated that the proposed IT adoption governance framework will assist in addressing various stakeholder issues on IT adoption in organisations. For example, it provides for mechanisms to consider and accommodate different stakeholder input on IT adoption decision making. Such a move will empower stakeholders in IT adoption strategies as part of addressing the decision-making problem discussed in the previous chapter. The proposed IT adoption governance framework is expected to facilitate the understanding of an IT adoption problem situation before selecting an IT adoption strategy in organisations.

The proposed IT adoption governance framework is anticipated to assist organisations to understand IT adoption problem situations in organisations, as it provides a holistic approach based on systems approaches. The proposed framework helps decision makers understand the IT adoption problem context in organisations from different stakeholders' perspectives. The next sections (3.4.1 – 3.4.5.4) briefly discuss the components of the proposed IT adoption governance framework shown in Figure 3.3.

### **3.4.1 IT Governance Component**

The IT governance component will be concerned with value delivery, strategic alignment, performance measure, risk management and resource management in the organisation (IT Governance, 2011; Mirza, 2010; Turel & Bart, 2014; Nugroho, 2014). The assignment of responsibilities to decision areas helps to achieve a balanced governance structure for IT adoption decisions that meet stakeholder requirements (IT Governance, 2011). A balanced IT governance structure with business representatives in IT adoption decision making is important in order to achieve business objectives (see section 2.6). Most IT adoption success

has been attributed to the alignment of IT and business objectives (IT Governance, 2011).

The IT governance component helps in assigning decision rights to IT decisions areas during IT adoption in organisations (see section 2.6). The biggest challenge to IT adoption decision making has been cited as the failure to reconcile different business units' objectives in organisations. In order for organisations to benefit from IT adoption there is need for coordination from both IT and the business side of the organisation. The alignment of business and IT strategy is important to realize value from IT investments in organisations (see section 2.6). The IT Governance (2010) concur that IT and business alignment ensures that IT investments meet the business needs of organisations.

The IT governance component ensures that IT investments consider the business objectives and goals. IT Governance Institute (2008) claims that poor IT governance is costing organisations billions of dollars each year after failing to improve business performance as expected. The IT governance component assists in making better IT adoption decisions in organisations that help to get buy-in from stakeholders (Jokonya et al., 2011). The IT governance component, therefore, assists in balancing the diverse IT adoption needs of multiple stakeholders in organisations.

### **3.4.2 Stakeholder Participation Component**

The stakeholder participation component of the preliminary framework ensures that IT adoption decisions are made in the interest of the stakeholders in organisations (section 2.7). A stakeholder is defined as an individual or group with an organisation interest (stake) who may be affected by decisions taken by the organisation (Freeman, 2011; Achterkamp et al., 2013). Whilst stakeholders may be internal and external, this framework focuses on internal stakeholders, such as end users, management and IT professionals. The reason of excluding external stakeholders in this study was their accessibility. The stakeholder component promotes stakeholder participation and involvement in order to adequately explore their requirements before a final decision is made on IT adoption (see section 2.7). The involvement of stakeholders ensures that the solution to IT adoption problems comes from those affected and closest to the problem situation in organisations (Cordoba, 2009; Mirza, 2010; Reynolds, 2014). The stakeholder participation component therefore helps achieve the bottom up approach to IT adoption, thereby meeting the requirements of the intended beneficiary of the information technology.

The stakeholder participation component of the framework is expected to answer the ‘how?’ part during IT adoption decision making in the organisations (see section 2.7). This is important since IT adoption success depends not only on technical issues but also on social issues which are part of organisational life. The failure to represent stakeholders’ interests during IT adoption decision making in organisations is likely to result in IT adoption failure (see section 2.7). The impact of IT adoption varies for the different stakeholder groups in the organisation; hence the identification of stakeholders who might be impacted by the IT adoption is important for the success of the adoption exercise (Freeman, 2011). The different stakeholder groups may also have different perceptions about the benefits of IT adoption in the organisations (see section 2.7). The stakeholder approach component in the preliminary framework ensures that stakeholders are identified during IT adoption decision making in organisations.

### **3.4.3 Technology Acceptance Model Component**

The technology acceptance model (TAM) component is useful in understanding individual behaviour in IT adoption (see section 2.2). The two TAM constructs, *perceived usefulness* and *perceived ease of use* are important determinants in IT adoption from an individual perspective as opposed to an organisational perspective (Benbasat et al., 2007; Lawrence, 2010; Oliveira & Martins, 2011). The TAM component helps understand individual needs and behaviour on IT adoption decision making in organisations (see section 2.2). IT adoption in organisations is complex in nature as it involves individuals with different perspectives. Therefore, it is important to distinguish an individual perspective from an organisational perspective during IT adoption in organisations (Lawrence, 2010). IT adoption in organisations is a two phased approach which involves first the organisational adoption before any individual adoption of the technology. While the particular IT adoption may have advantages for the organisation, it might not be the case for other stakeholders in the organisation (Cordoba, 2009).

### **3.4.4 Sociological Paradigm Component**

The sociological paradigm component assists with understanding the nature of the problem context before IT adoption decision making takes place in the organisation (see section 2.8). The four sociological paradigms (functionalist, interpretive, radical structuralist and radical humanist) are based on different perspectives of a problem context (Burrell & Morgan, 1979;

Kendall, 2013; Tittenbrun, 2014). The understanding of the nature of the context is vital in selecting the appropriate system approach of a particular IT adoption problem context. The sociological paradigm offers decision makers a way to look at problem context from different worldviews before an intervention strategy to the problem situation (see section 2.8).

The sociological paradigm component acknowledges that individual paradigms are not mutually exclusive as such, but only offer guidelines about where the main emphasis of the paradigm lies (Jackson, 2003; Reynolds & Ulrich, 2010; Reynolds, 2014). In some cases the problem situation may require the use of more than one system approach as pointed out before (see section 2.8). The sociological paradigm provides creative ways of addressing the IT adoption decision making problem as it embraces different paradigms to complex problem situation. During IT adoption it may be necessary to see which sociological paradigm is the most suitable to the problem situation at hand. The selection of a particular sociological paradigm and its underpinning organisational theory helps understand the IT adoption problem context in organisations.

The sociological paradigm component with different paradigms helps decision makers to abandon their old worldviews and not take for granted any assumptions on IT adoption decision making (see section 2.8). In this regard the sociological paradigm component helps to select appropriate systems approaches during IT adoption decision making in organisation. Each paradigm in the component emphasises different aspects of the IT adoption problem context and offers different analytical approaches (see section 2.8). The next section briefly discusses the functionalist sub-component of the framework.

#### **3.4.4.1 The Functionalist Sub Component (Objective-Regulation)**

The functionalist sub-component of the sociological paradigm component assumption is that human actions are rational and can be hypothesized (Burrell & Morgan, 1979; Stacey, 2007, Blyth, 2012). IT adoption objectives associated with this functionalist sub-component have emphasis on promoting and ensuring efficiency and effectiveness in organisations (see section 2.8.1). Most of the IT adoption objectives of efficiency and effectiveness are part of the operational activities which are important to organisations. The assumption of the functionalist sub-component is that the stakeholders have unitary worldviews and agree on the IT adoption goals and objectives (Jackson, 2003; Hassan, 2013).



The main focus of the functionalist sub-component is on the “how to” as opposed to the “what is” of the IT adoption decision making as it assume the existence of agreed objectives in organisations (see section 2.8.1). The functionalist sub-component assumption is that different perceptions and requirements of stakeholders are not seen as important. The challenge of this paradigm assumption is that not all IT adoption problems are of this nature hence the need for other paradigms. The next sub-section briefly discusses the interpretive sub-component of the sociological paradigm component.

#### **3.3.4.2 The Interpretive Sub-Component**

The interpretive sub-component of the sociological component’s assumption is that we live in a subjective world where meanings are understood through the interpretation of individual perceptions of viewing things (Burrell & Morgan, 1979; Hassan, 2013). The interpretive sub-component assumes that IT adoption decision making in organisations is reached through consensus after debate by stakeholders (see section 2.8.2). The interpretive sub-component’s view is that the participation of different stakeholders is important in IT adoption decision making since it is a social construct (Reynolds & Ulrich, 2010). The stakeholders closer to the problem situation are assumed to be more knowledgeable and best to be consulted in IT adoption requirements (Cordoba, 2009). The subjective nature of the paradigm allows different stakeholder views to be accommodated. The challenge of this paradigm is that it cannot handle IT adoption situations of a coercive nature (see section 2.8.2).

#### **3.3.4.3 Radical Structuralist Sub-Component**

The radical structuralist sub-component of the sociological paradigm component’s assumption is that there is no fairness in society, which is full of politics, coercion and social conflicts (Burrell & Morgan, 1979; Blyth, 2012). The radical structuralist sub-component assumes that IT adoption in organisations is characterized by power domination, which results in conflicts and instability (see section 2.8.3). The discrimination of certain stakeholders is based on demographic characteristics such as gender, race and status (Hassan, 2013). The radical structuralist sub-component emphasis is on emancipating the oppressed stakeholders during IT adoption in organisations (see section 2.8.3). The radical structuralist sub-component assumes that stakeholders do not have expertise for them to be involved and consulted in IT adoption decision making in organisations (Burrell & Morgan, 1979).

#### **3.3.4.4 Radical Humanist Sub-Component**

The radical humanist sub-component of the sociological component’s assumption is that

organisations and society are too complex to be understood using one paradigm (Burrell & Morgan, 1979; Hassan, 2013). The concern of this radical humanist sub-component is that IT adoption decision making in organisations may be too complex to be resolved using one paradigm (see section 2.8.4). The radical humanist paradigm promotes pluralism of paradigms during IT adoption decision making in organisations as the IT adoption problem context may require a combination of two paradigms. The radical humanist sub-component allows subject interests and perspectives of stakeholders during IT adoption to be accounted for, and promotes diversity and subjective viewpoints (Burrell & Morgan, 1979; Blyth, 2012). The sub component seeks to emancipate stakeholders from all forms of oppression during IT adoption decision making in organisations (see section 2.8.4).

### **3.3.5 Systems Approaches Component**

The previous sections discussed the individual sociological paradigm sub-components' contribution to the preliminary IT adoption governance framework. This section discusses the systems approaches' main component of the preliminary IT governance framework for assisting organisations with IT adoption decision making. The systems approaches' main component is made up of four sub-components. The sub-components are; hard systems thinking, soft systems thinking, emancipatory systems thinking and critical systems thinking. The systems approaches' main component assumption is that there is no one-size-fits-all approach with regard to IT adoption decision making in organisations (Jackson, 2010).

The assumption is that there is a fit between problem contexts to a particular systems approach (Reynolds & Ulrich, 2010). It is, therefore, important to understand the IT adoption problem context before selecting a most suitable systems approach for any given situation. It is anticipated that the holistic nature of a systems approaches' component will assist organisations to make better IT adoption decisions (see section 2.9). The preliminary framework based on systems approaches supports a holistic approach to complex problem situations of IT adoption in organisations as opposed to the traditional deterministic approaches (Cordoba, 2009; Jackson, 2010). The framework may help decision makers to understand the IT adoption benefits from different stakeholders' worldviews. A brief discussion of systems approaches sub-components follow in the next sections.

#### **3.3.5.1 Hard Systems Thinking Sub-Component**

The hard systems thinking sub-component will assist to address IT adoption problem

situations in organisations that are targeted at improving efficiency and efficacy in a scenario having set goals and agreed objectives (Jackson, 2003; Reynolds & Ulrich, 2010). The hard systems thinking sub-component assumes that IT adoption in organisations can be understood using cause and effect relationships; and one can rely on such relationships to resolve problem situations (see section 2.9.1). The sub-component's assumptions are that there are fixed agreements on the set of objectives for IT adoption in organisations (Reynolds & Ulrich, 2010). The issue with IT adoption problem situations becomes "How" to do it, which can be resolved by hard systems thinking, as opposed to the "What" question. The nature of a problem situation may involve an improvement of an existing process in the organisation to become more efficient (section 2.8.1).

The hard systems thinking sub-component assumes that IT adoption problem situations are resolved by finding efficient ways to known defined ends and that there are predefined organisational goals (see section 2.9.1). Most of the IT adoption objectives to be resolved by the hard systems thinking sub-component have to do with the "how to" question of achieving operational efficiency and effectiveness in the organisation. The hard systems thinking sub-component's use of scientific methods and mathematical models is important to solve operational problem situations facing organisations (Jackson, 2010). Notable examples of such efficient systems are electronic data interchange (EDI) and just in time (JIT) inventory management systems that have been credited with improving organisation efficiency and effectiveness.

The hard systems thinking sub-component's predictive and regulative nature embraces the functionalist paradigm (Reynolds & Ulrich, 2010). The tendency of assuming a unitary purpose in problem contexts results in the system serving the needs of the powerful stakeholders at the expense of the affected. The challenge of a hard systems thinking sub-component is its attempt to use models which are only a partial representation of world reality (see section 2.9.1). A hard systems thinking sub-component is not good at handling complex socio-technical problems as it distorts the reality of a social context. The challenges of a hard systems thinking component are in dealing with pluralistic problem situations resulting in the need for a soft systems thinking sub-component to IT adoption in organisations (see section 2.9.1). The hard systems thinking sub-component has difficulties in IT adoption contexts which need subjective interpretations of the individual worldviews.

### **3.3.5.2 Soft Systems Thinking Sub-Component**

The soft systems thinking sub-component of the framework assumption is that knowledge can be obtained from interpreting human thoughts and feelings through debates (Reynolds & Ulrich, 2010). The soft systems thinking sub-component assumes that IT adoption improvements and benefits in organisations are subjective, since stakeholders have different worldviews (section 2.9.2). The sub-component will support pluralism of stakeholders' worldviews during IT adoption in organisations (Reynolds & Ulrich, 2010). The sub-component will assist with institutionalizing learning during IT adoption by accommodating different stakeholder worldviews. The soft systems thinking sub-component does not subscribe to the notion of predefined models to IT adoption decision making in organisations, as every situation is unique (Reynolds & Ulrich, 2010). The sub-component which embraces subjectivity will encourage systemic learning during the process of IT adoption decision making in organisations (see section 2.9.2)

The soft systems thinking sub-component will assist to structure debate during IT adoption decision making in organisations to discuss issues of concern. The soft systems thinking sub-component is suitable for problem contexts where there is little agreement on objectives and a need exists to debate among stakeholders (see section 2.9.2). The soft systems thinking sub-component assists exploring the nature of the problem context through learning from those involved and affected by IT adoption in the organisations.

In order to agree on objectives it may be necessary to debate among those involved or affected by the IT adoption exercise. The soft systems thinking sub-component assumption is that the environment is conducive to debate without coercive effects. The soft systems thinking sub-component as an interpretive systems approach embraces subjectivity to IT adoption problem situations rather than objectivity. The sub-component subscribes to the view that stakeholder participation and involvement are important in IT adoption decision making (see section 2.9.2)

The sub-component challenges the existences of value free models as misguided to real world IT adoption problem situations and supports the view that in social systems objectivity is approached through interaction of stakeholders with diverse values (see section 2.9.2). The soft systems thinking sub-component will help to get buy-in and consensus from the stakeholders during IT adoption decision making in organisations (see section 2.9.2). The soft

systems thinking sub-components such as soft system methodology have been used extensively in information system design in organisations (see section 2.9.2). The success of a soft systems thinking sub-component to IT adoption is its embracing of subjectivity to social problem situations. The soft systems thinking sub-component will assist in understanding multiple stakeholder perspectives during IT adoption decision making in organisations (Reynolds, 2012). The soft systems thinking sub-component will encourage constructive debate and accommodate social factors such as values, beliefs and feelings about the nature of improvement during IT adoption in organisations (Reynolds, 2012).

Although a soft systems thinking sub-component has been useful to resolve most ill-structured IT adoption problem situations its challenge is dealing with coercive problem situations (Jackson, 2010). Some IT adoption decisions are of a coercive and conflict nature which cannot be easily debated whilst neglecting the power structure in organisations. The lack of rules on structured debate on IT adoption decision making may result in the outcome of the debate being determined by those with power (Reynolds & Ulrich, 2010). Therefore a soft systems thinking sub-component cannot guarantee genuine or equal participation of stakeholders during IT adoption in organisations (see section 2.9.2). The IT adoption decision making needs to be accompanied by challenges to the existing power structure in the organisation, which is beyond the capabilities of soft system thinking approaches (see section 2.9.2).

### **3.3.5.3 Emancipatory Systems Thinking Sub-Component**

The emancipatory systems thinking sub-component of the framework assumption is that organisations are full of discrimination and oppression of certain stakeholders (Reynolds & Ulrich, 2010; Reynolds, 2014). The sub-component will assist in emancipating and empowering oppressed stakeholders during IT adoption in organisations (See section 2.9.3). The emancipatory systems thinking sub-component perceives IT adoption in organisations as being dominated by power relations. The sub-component will help democratize the IT adoption decision making process by allowing debates in organisations (Reynolds & Ulrich, 2010). The emancipatory systems thinking sub-component addresses issues of conflicts during IT adoption in organisations.

The emancipatory systems thinking sub-component will help to reveal all forms of alienation and oppression of particular groups during IT adoption in organisations (Jackson, 2010; Reynolds & Ulrich, 2010). The success of the sub-component will be measured by reducing

marginalization and discrimination of stakeholders during IT adoption decision making in organisations. The sub-component helps question the beneficiary of the IT adoption and will seek to empower those affected by the decision (see section 2.9.3). The emancipatory systems thinking component will help create a democratic environment making sure that all voices are heard during IT adoption in organisations. The sub-component will promote fairness as it disregards the influence of power and hierarchy during IT adoption in organisations (Reynolds & Ulrich, 2010).

The emancipatory systems thinking sub-component's democratic dialogue will ensure that participants are exposed to other's worldviews during IT adoption decision making in organisations (see section 2.9.3). The sub-component will establish participating rules and ensure democratic dialogue during IT adoption decision making in organisations. It will provide a context necessary for democratic IT adoption decision making although it does not guarantee that the agreements can be implemented in the organisation (see section 2.9.3).

The emancipatory systems thinking sub-component will ensure that the disadvantaged stakeholders (affected but not involved) participate in IT adoption decision making. The goal of an emancipatory systems thinking sub-component will be to enable genuine participation of stakeholders in IT adoption decision making in organisations (Reynolds & Ulrich, 2010). The sub-component will be useful for addressing conflicts during IT adoption decision making in organisations and allow questions to be asked about those who are affected by the IT adoption decisions (Reynolds, 2012; Jackson, 2010).

#### **3.4.5.4 Critical Systems Thinking Sub-Component**

The critical systems thinking sub-component of the framework's assumption is that IT adoption decision making in organisations are too complex to be understood, let alone solved, using a single approach (Reynolds & Ulrich, 2010). The critical systems thinking sub-component assumes that different approaches (hard, soft and emancipatory) can be used together to complement each other in complex IT adoption context in organisations. The hard system thinking sub-component focuses on operational issues of effectiveness and efficiency (Reynolds & Ulrich, 2010). The soft system thinking sub-component will address subjective issues associated with IT adoption in organisations. The critical systems sub-component will promote diversity of worldviews and pluralism during IT adoption decision making in organisations (Jackson, 2010).

The critical systems thinking sub-component helps organisations to adopt information technologies that meet the needs of different stakeholders. The sub-component assumption is not to claim to know answers in advance or offer the same solution to different IT adoption problem situations since each situation is unique. The sub-component is against the imposition of order to complex IT adoption problem situations in organisations (see section 2.9.4). The component supports pluralism of worldviews and ensures that voices of the marginalised are heard during IT adoption decision making in organisations (Reynolds & Ulrich, 2010).

The insight from a critical systems thinking sub-component is that each approach has a weakness which can be compensated by the strength of another approach. The critical systems thinking sub-component will promote the accommodation of different approaches during IT adoption decision making in organisations. The use of more than one approach will promote rigor in IT adoption decision making in organisations (see section 2.9.4). The critical systems thinking sub-component will ensure that voices of the marginalised stakeholders are heard during IT adoption decision making in organisations. The critical system thinking sub-component will encourage the diversity of viewpoints during IT adoption decision making as it assumes benefits are subjective (see section 2.9.4). Having discussed the systems approaches' sub-components the next section concludes Chapter 3 of the preliminary IT adoption governance framework to assist organisations with IT adoption governance.

### **3.5 Conclusion**

This chapter discussed the preliminary IT adoption governance framework for assisting organisations with IT adoption. This chapter contended that individual components and sub-components' weaknesses may be addressed by using them in combination. The main assumption behind the preliminary framework is that IT adoption decision making in organisations is a complex socio-technical phenomenon as it is both objective and subjective in nature. The preliminary framework has the potential to address both objective and subjective issues which are common to IT adoption decision making in organisations.

The preliminary framework assumption is that different framework components are well suited for addressing different problem contexts, therefore there is no one-size-fits-all approach to IT adoption decision making in organizations. The preliminary framework challenges organisations to understand the IT adoption problem context in order to find a set of suitable approaches to solve the IT adoption problem situation. The four sub-components

of the sociological paradigm component provide guidelines for selecting the appropriate set of approaches for the IT adoption problem situation at hand in organisations. In order to select the appropriate systems approaches it is, therefore, important to understand the problem context using the sociological paradigm component. The different systems approaches are suitable for different IT adoption problem contexts in organisations.

The preliminary framework challenges the one-size-fits-all approach to complex phenomena such as IT adoption decision making in organisations. The problem contexts which fit hard systems thinking approaches require stakeholders to agree on IT adoption objectives in organisations. Whilst soft systems thinking approaches are suitable for IT adoption problem context where stakeholders have a divergence of worldviews, they have been found unsuitable to address conflicting environments. However, the problem contexts, which are of a coercive nature, may require emancipatory systems thinking approaches that are suitable for emancipating the oppressed stakeholders during IT adoption in organisations. In some cases, the problem context may be so complex as to require the analysis to use more than one approach. Critical systems thinking approaches support the use of more than one approach as a way of complementing each other's weaknesses.

In summary, in order to accommodate different perspectives of IT adoption problem situations by different stakeholders there is a need for systems approaches to consider the holistic nature of IT adoption problem situation context in organisations. This chapter proposed the IT adoption governance framework for assisting organisations with IT adoption governance. The chapter discussed the advantages of different sub-components of the preliminary IT adoption governance framework. The preliminary IT adoption governance framework is based on the assumption that there is no one-size-fits-all approach to IT adoption decision making in organisations. The next chapter discusses the research methodology for validating the preliminary IT adoption governance framework to assist organisations with IT adoption decision making.

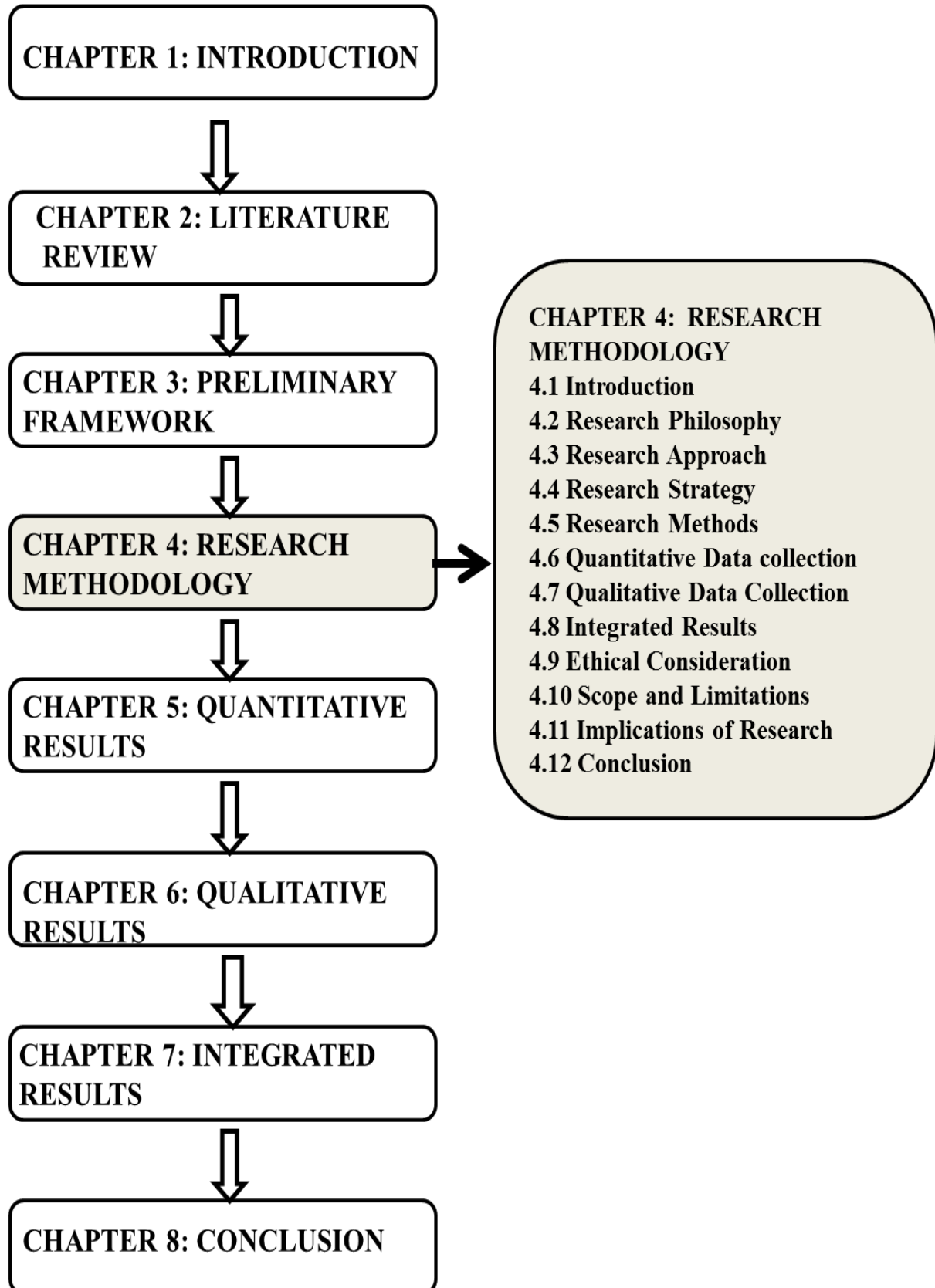
Table 3.1: Summary Table of Existing Frameworks

Framework /Model /Approach	Authors	Advantages/Challenges	Framework /Model /Approach Component
TAM Model	Davis (1989) Du Plooy (1998) Weilbach &	<u>Advantages</u> -Provide insight on -individual behaviour <u>Challenges</u> -Deterministic approach -Technical oriented	Perceived Usefulness Perceived Ease of Use



	Byrne (2010)	<ul style="list-style-type: none"> <li>-Ignore artifacts design</li> <li>-Suitable for individual behaviour</li> <li>-Ignores social context</li> <li>-Not suitable for organisation context</li> </ul>	
IT Governance Framework	Holick et al. (2005) Kim et al. (2009) Ven et al. (2008) Weill (2004) Weill et al (2005)	<b><u>Advantages</u></b> <ul style="list-style-type: none"> <li>-Align IT to business</li> <li>-Provide IT Value Delivery</li> <li>-Reduce Risk to IT</li> <li>-Manages IT Resources</li> <li>-Measure IT Performance</li> </ul> <b><u>Challenges</u></b> <ul style="list-style-type: none"> <li>-Uses top down approach</li> <li>-Uses positivist approach</li> </ul>	<ul style="list-style-type: none"> <li>-IT business Alignment</li> <li>-Value Delivery</li> <li>-Risk Management</li> <li>-Resource Management</li> <li>-Performance Measure</li> </ul>
Stakeholder Approach	Cordoba (2009) Freeman (1984)	<b><u>Advantages</u></b> <ul style="list-style-type: none"> <li>-help to identify stakeholders</li> <li>-Promote stakeholder engagement</li> <li>-Improves communication</li> </ul> <b><u>Challenges</u></b> <ul style="list-style-type: none"> <li>-No suitable for implementation</li> <li>-Does not address areas of conflict</li> </ul>	<ul style="list-style-type: none"> <li>-Stakeholder Identification</li> <li>-Stakeholder Analysis</li> </ul>
Hard Systems Approaches	Jackson (2003)	<b><u>Advantages</u></b> <ul style="list-style-type: none"> <li>-Suitable for improving efficiency</li> <li>-Good at implement projects with clear objectives</li> </ul> <b><u>Challenges</u></b> <ul style="list-style-type: none"> <li>-Limited at simple problem situations</li> <li>-Understand problem based on individual parts</li> <li>-Fail to appreciate social context</li> <li>-Treat IT adoption as deterministic</li> <li>-Assumes stakeholder consensus</li> </ul>	<ul style="list-style-type: none"> <li>-Operations research</li> <li>-Viable system model</li> <li>-Systems Analysis</li> <li>-System Dynamics</li> <li>-Organisational Cybernetics</li> <li>-Complexity Theory</li> </ul>
Soft Systems Approaches	Checkland (1990)	<b><u>Advantages</u></b> <ul style="list-style-type: none"> <li>-Promote stakeholder engagement</li> <li>-Accommodate divergence stakeholder interest</li> <li>-Analyze stakeholder perspective</li> <li>-Focus on end user not technology</li> <li>-Shift focus to social issues</li> </ul> <b><u>Challenges</u></b> <ul style="list-style-type: none"> <li>-Does not address conflict</li> </ul>	<ul style="list-style-type: none"> <li>-Soft Systems Methodology</li> <li>-Strategic Assumption Surfacing and Testing</li> <li>-Interactive Planning</li> </ul>
Emancipatory Systems Approaches	Ulrich (2001)	<b><u>Advantages</u></b> <ul style="list-style-type: none"> <li>-Addresses areas of conflict</li> <li>-Empowers disadvantaged stakeholder</li> <li>-Avoids discriminations of stakeholders</li> <li>-Ensures genuine participation stakeholders</li> </ul> <b><u>Challenges</u></b> <ul style="list-style-type: none"> <li>Lacks theoretical and methodology pluralism</li> </ul>	<ul style="list-style-type: none"> <li>-Critical Systems Heuristics</li> <li>-Team Syntegrity</li> </ul>
Critical Systems Approaches	Jackson (2003)	<b><u>Advantages</u></b> <ul style="list-style-type: none"> <li>-Supports methodology pluralism</li> <li>-Support critical awareness of methodologies</li> <li>-Promote rigour problem situation</li> <li>-Supports multi-methodology</li> </ul> <b><u>Challenges</u></b> <ul style="list-style-type: none"> <li>Difficult to put into practice</li> </ul>	<ul style="list-style-type: none"> <li>-Critical Systems Practice</li> <li>-Total Systems Intervention</li> <li>-System of systems methodologies</li> </ul>

## CHAPTER 4: DIAGRAMMATIC OVERVIEW



## **CHAPTER 4: RESEARCH METHODOLOGY**

### **4.1 Introduction**

The previous chapter discussed the preliminary IT adoption governance framework to assist organisations with IT adoption decision making. This chapter discusses the research methodology for validating the preliminary IT adoption governance framework to assist organisations with IT adoption decision making. The research design includes the research philosophical assumptions, research methods, data collection techniques, data analysis and presentation approach. The research design helps link the research problem to the methodology, the data collection technique and the analysis strategy in order to answer the research question and strengthen the research validity (Yin, 2011). The research design also provides a plan and procedures for the research in terms of strategies, sources of evidence, data analysis and presentation (Creswell, 2009). The research procedure explains the philosophical assumptions of the research, the strategy of inquiry, methods of data collection and analysis employed in the research.

The research design is informed by the philosophical assumptions of the researcher, research method, data collection and analysis (Creswell, 2009). The research methodology helps to validate the IT adoption governance framework through investigating participants' perceptions towards the preliminary framework. The preliminary framework is expected to help in governing IT adoption decision making in organisations and contribute to the existing body of knowledge. The literature review suggests that understanding IT adoption decision making in organisations requires a multi-disciplinary approach (Cordoba, 2009; Oates, 2009). The literature review also suggests that the complexity of IT adoption by organisations makes it both objective and subjective in nature.

This chapter is organized as follows: section 4.2 presents the research philosophy, section 4.3 discusses the research approach, section 4.4 discusses the research strategy, section 4.5 discusses the research methods and time horizons, section 4.6 discusses quantitative data collection, section 4.7 discusses qualitative data collection, section 4.8 discusses integrating results, section 4.9 discusses limitations, section 4.10 discusses ethical considerations and section 4.11 offers a conclusion. The next section discusses the philosophy of the research which provides the basis of assumptions guiding the conduct of the research.

## 4.2 Research Philosophy

Creswell et al. (2011) argue that the researcher should articulate the philosophical assumptions that provide the foundation for the research. The philosophical assumptions provide the paradigms (worldviews) that shape the development of the research. The researcher needs to articulate how different paradigms are going to be integrated in answering the research problem. The pragmatic philosophy was used to integrate the findings as part of the discussion and conclusion. The research therefore integrates three philosophical assumptions as part of answering the research question.

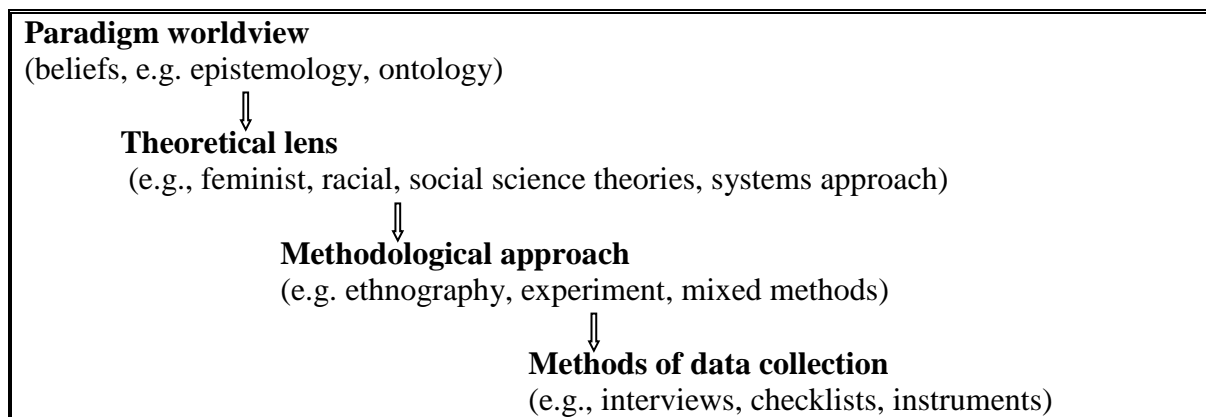


Figure 4.1: Four Levels for Developing a Research Study – (Source: Adapted from Crotty; 1998)

Creswell et al. (2011) contend that a philosophical framework helps to position and articulate how the design fits with the study. Crotty (1998) says that “in designing a study, there are four major elements which are: paradigm/worldview (beliefs, for example, epistemology, ontology), theoretical lens (for instance, feminist, racial, social theories), methodological approach (for example, ethnography, experiment, mixed methods) and methods of data collection (such as interviews, checklists, instruments)” as shown in Figure 4.1.

Creswell et al. (2011) defines a paradigm as the tradition of research regarded as authoritative by a particular community. Paradigms are sets of ideas, assumptions and beliefs that shape and guide a community’s way of seeing things (world views). World views are defined as mental models of an individual or collective group (Jackson, 2003). People’s mental models are determined by interactions with others in the society. How individuals or groups perceive reality, the social world, is based on their mental models (world views). An organisation’s culture is seen as the collective world views (lenses of seeing reality) of its members (Jackson, 2003).

Epistemology which is at the broadest level of philosophical assumptions explains how researchers gain knowledge about what they know (Creswell et al., 2011). Each theoretical perspective embodies a certain view of existence and reality (ontology) as well as a certain way of understanding what it means to know (epistemology). Crotty (1998) defines ontology as a community based world view about the nature of our world. Ontology is the study of being that sits alongside epistemology informing the theoretical perspective (Creswell et al., 2011). The research theoretical stance that the researcher takes is informed by the philosophical assumptions drawn from a particular theory. Lastly, the methodology informs the appropriate methods and procedures for data collection, analysis and interpretation

Guba and Lincoln (2005) note that in mixed methods research, philosophical assumptions guide the research inquiry at a broader level. The assumptions are the worldviews the researcher brings to their inquiry in terms of how knowledge informs the study (Maxcy, 2003; Brewer & Hunter, 2006; Creswell et al., 2011). The most common worldviews (paradigms) are positivist, post-positivist, constructivist, participatory and pragmatist. Oates (2009) defines positivism as a scientific method inherited from the natural sciences that believes in an ordered and regular world view that can be studied objectively. The positivist approach believes that reality exists concretely, can be discovered, is measurable and is independent of the observers (Myers, 2009). Positivist and post-positivist (objective) views are more associated with a quantitative research approach whereas constructivist (subjective) views are more associated with the qualitative research approach. The participatory paradigm is more influenced by political concerns and is more associated with the qualitative approach. The pragmatism paradigm focuses more on addressing the research problem than being restricted to one paradigm. In addressing the research problem with what works, pragmatism is pluralistic and may combine different paradigms and method (Greene, 2006; Creswell et al., 2011; Agerfalk, 2013).

Creswell et al. (2011) concede that while worldviews operate at broader perspective based on Figure 4.1, theoretical foundations operate at a narrow perspective in research as a lens (stance) taken by the researcher to provide direction for different phases of the project such as social theory and systems approaches. The theoretical stance shapes and directs what type of theory to use in the study such as social theory or systems theory. The theory provides the framework that guides the nature of questions to be asked and answered by the study. The choice of data collection - quantitative and qualitative or both - is determined by the

theoretical framework. From a study perspective, the theory guides the questions to the study and informs the procedures and major variables of the study. The theory also provides a framework for the data collection phase of the research (Creswell et al., 2011; Asif, 2013; Caruth, 2013; Rowe, 2012; Fassinger & Marrow, 2013). The next sub-section discusses the research paradigm of the study which is the worldview and assumptions associated with the study.

#### **4.2.1 Research Paradigm**

Teddlie & Tahakkori (2009) define paradigm (worldview) as various philosophical assumptions associated with a point of view in a study. Kuhn (1996) note that there are several paradigms which exist simultaneously and compete in a given field. According to Morgan (2007) the five types of paradigms (positivist, post-positivist, constructivist, participatory and pragmatist) differ in their generality since they can be viewed as worldviews, epistemologies, and typical solutions to problems or shared beliefs of a research field. These five paradigms therefore differ in terms of their philosophical elements such as ontology, epistemology, axiology, methodology and rhetoric (Creswell et al., 2011). This study adopts the pragmatism worldview which accepts singular and multiples realities (provide multiple perspectives from an ontological point of view). The researcher therefore takes multiple stances on both biased and unbiased perspectives. The methodology involved combining and mixing quantitative and qualitative data as part of research process.

Creswell et al. (2011) note that research design can determine the study related worldview (paradigm). They add that worldview assumptions help shape the mixed methods constructs and procedures. On one note, positivist and post-positivist which are more associated with quantitative methods, helps selecting variables that can be empirically measured and observed. On another note, the constructivist (qualitative) perspective helps to elicit multiple meanings from participants and build a deeper understanding than the quantitative method would yield and possibly generate theory or patterns of responses which can explain quantitative results (Creswell et al., 2011; Zvandvanian & Daryapoor, 2013).

While there has been debate on whether it is feasible to combine radically different methods based on different paradigmatic assumptions, this appears to be acceptable from literature (Venkatesh et al., 2013). The paradigm debate which existed has been resolved by the emergence of the compatibility thesis which states that mixing quantitative and qualitative methods is acceptable to answer the research problem (Teddlie et al., 2009; Zvandvanian &

Daryapoor, 2013). Many researchers have accepted that a peaceful coexistence of different methodologies and paradigms is possible in conducting research (Mingers, 2001; Ridenour & Newman 2008; Teddlie & Tashakkori, 2009). Many researchers have called for method triangulation (quantitative and qualitative) to develop a deeper understanding of a phenomenon (Venkatesh et al., 2013). Many researchers also concur that multiple paradigms can coexist peacefully in a research inquiry. Creswell et al. (2011) notes that most researchers have embraced pragmatism as the suitable paradigm (worldview) for mixed methods research, with only a few still participating in the paradigm debate. Having discussed the research philosophy, the next section discusses the approach found suitable to address the research problem.

### **4.3 Research Approach**

Pragmatism values diverse approaches (both objective and subjective knowledge) in employing what works to address research problems (Greene, 2007; Creswell et al., 2011). Tashakkori and Teddlie (2003) emphasize that the research question is more important than the method and philosophical worldviews that underlie the method as both qualitative and quantitative questions can be used in a single study. Pragmatism criticizes the dichotomy between objective (positivist) and subjective (constructivist) in addition to abandoning the 'truth' and reality concepts in favour of practicality in guiding methodological choices (Creswell et al., 2011). Pragmatism believes in practicality: what works to address the research problem is more important from an epistemology perspective than being restricted to one method.

Pragmatism is supported by the multiple view stance of mixed methods research which states that multiple paradigms may be used but must be explicit in their use (Morse, 2003; Brewer & Hunter, 2006; Agerfalk, 2010; Creswell et al., 2011). Pragmatism philosophy is based on the assumption that no one approach is adequate to understand reality and develop knowledge. The essence is that, both the lived experience (qualitative) and the reliability of empirical counts (quantitative) are important for better understanding of a phenomenon. The pragmatism philosophy was found to best serve the integration of mixed methods approaches and perspectives (Johnson et al., 2007; Agerfalk, 2013). Pragmatism supports both inductive and deductive as part of the research cycle to answer a research question (Morgan, 2007; Teddlie et al., 2009; Trahan & Stewart). During the research cycle, the research used inductive or deductive inferences and qualitative and quantitative methods simultaneously.

Pragmatism supports the view that epistemology issues exist on a continuum not a dichotomy of objectivity and subjectivity, which are two opposing poles. Complex research study may require highly interactive relationships between researcher and participants in a qualitative approach (Teddlie et al., 2009). At the same time a researcher may not require interaction with participants in a quantitative research approach. From an axiological consideration pragmatism places importance on the researcher's value system when conducting and drawing conclusion from research. Researchers choose what topic to research, and what unit of analysis and variables to include in the research based on their personal value systems.

The incompatibility thesis which claims that it is difficult to integrate methods from different paradigms has been discredited by many scholars (Morse, 2003; Brannen, 2008; Bryman, 2008, Teddlie et al., 2009). Most scholars have proved that it is possible to integrate methods from different paradigms as part of research projects. Those who do not endorse pragmatism completely have influenced the complementary strength thesis (Bryman, 2007; Brewer & Hunter, 2006; Teddlie et al., 2009). The complementary thesis states that it is possible to have mixed methods research but the different components must be kept separate to realize their strengths (Bryman, 2006; Bergman, 2008; Teddlie et al., 2009). Having discussed the research approach, the next section discusses the research strategy.

#### **4.4 Research Strategy**

A case study research strategy was found to be suitable for the study as it embraces multiple paradigms in understanding the complexity of IT adoption decision making in organisations. The case study research allowed participants exposed to the same IT adoption environment to participate in the study which was an important factor for the validation process. In addition to that the case study design provided the possibility for participants of the first quantitative phase (same sample) to be selected for the second qualitative phase. A case study, therefore, helped enable repeated access to the same participants in the organisation to get more information about the phenomenon (Yin, 2011). This helped to answer inconclusive questions and to make the results more credible (triangulation by method and data source). Creswell (2011) confirms that case study research helps to bridge multiple methods and sources of evidence in a single study.

The case study research strategy in information systems research is accepted because of its suitability to provide understanding of the relationship between organisations and technology (Oates, 2009). Case study research has been found to be a viable research strategy in



information systems because of its in-depth approach. A case study research strategy is a well-established, tried and tested empirical inquiry (Yin, 2009) and has been found suitable for studying information systems in organisations (Oates, 2009). Case study research helps to answer the “how” “what” and “why” research questions on IT adoption decision making in organisations (Yin, 2009). Most of the research work undertaken in information systems, specifically addresses issues such as who made what decisions, and why these decisions were made (Oates, 2009). Case study research has been found most suitable to address research questions focused on how certain decisions such as IT adoption were made in the organisation and why those decisions were made in the first place.

Case study research strategy allows the researcher a deep understanding of a phenomenon using multiple sources of evidence (Yin, 2011). Case study research makes a contribution to knowledge in business through empirical evidence from real organisational problems such as IT adoption decision making. Case study research is appropriate at any stage of the research process where the researcher has no control of the contemporary real life situation (Myers, 2009). Yin (2009) criticizes some researchers’ misconception that case study research is only suitable for the exploratory phase as a preliminary research method. Case studies can also be used for any research such as exploratory, explanatory and descriptive case studies.

This research used the case study research strategy whose strength is based on multiple data sources (triangulation) (Myers, 2009). The case study research provided an opportunity for the researcher to validate the preliminary IT adoption governance framework for assisting organisations with IT adoption decision making in a normally inaccessible phenomenon. The case study was important because it allowed a follow up on the quantitative results in the qualitative interview phase as shown in Figure 4.2. The case study also means that the participants were exposed to the same IT adoption environment, which was useful to understand their perceptions from a single setting.

#### **4.4.1 Justification of number of Case Studies**

Rowley (2002) comments that one of the contentious questions has been how many cases are sufficient for multiple case studies and there is no simple answer as it depends on the research purpose and question. Case study research may adopt single case or multiple case designs depending on the research objectives and there is no ideal number of cases (Eisenhardt & Graebner, 2007). Case study research embraces multiple research paradigms which is the use of quantitative and qualitative data in a single study (Eisenhardt & Graebner, 2007). This

research used two case studies which were sufficient for the research objectives.

Lalor et al., (2013) contend that a case study strategy is useful to strengthen a sequential explanatory design allowing using both quantitative and qualitative paradigms to add completeness to the study. The case study research pragmatic approach allows utilizing qualitative and quantitative data sources to understand complex phenomena. Case study research provides an opportunity to bridge paradigms through the use of multiple sources of evidence and realities (Lalor et al., 2013). The sequential explanatory design based on a case study approach provides an opportunity to quantify evidence of the results.

The four types of designs for case studies are single case (holistic) designs, single case (embedded) designs, multiple case (holistic) designs and multiple case (embedded) designs (Yin, 2009). Rowley (2002) highlights that despite criticisms of case studies; they are widely used as they offer more insights than other approaches. Case studies are useful for explanatory, descriptive or exploratory research to answer the “How” and “Why” questions. Whilst Yin (2009) points out that evidence of multiple case studies is more compelling, he urges that the single case study rationale will not be satisfied by multiple case studies. In addition the non-use of sampling logic to case studies makes multi-case the same as single case studies since both cannot be used to infer or assess phenomena prevalence. Yin (2009) points out that case study research can be single or multiple, qualitative, quantitative or both.

A case study is appropriate for explaining relationships in real-life too complex for other research strategies (Yin, 2009). The advantage of case study research as an empirical study is that it is based on a real organisational story which can be identified as part of face validity (Myers, 2009). Most of the contemporary issues dealt with in case study research are common to many organisations. The proximity of the researcher to real-life situations make it feasible to explore multiple interpretations of the same situation not afforded by other research methods. In addition case study research provides an opportunity of first hand evidence on a particular phenomenon.

Yin (2009) points out that case studies help the real-life context of IT adoption decision making to be studied from the contextual perspective which it is part of. Myers, (2009) criticizes Yin’s (2009) definition of case study as being too narrow and too broad at the same time. The definition is more appropriate for positivist case studies as opposed to other

methods which do not use propositions like interpretive case studies. Yin (2009) has been criticized also for trying to evaluate all case study research designs in terms of construct validity, internal validity and reliability. The main strength of case study research is the opportunity to use multiple sources of evidence for triangulation in developing converging lines and corroboration. The use of multiple sources of evidence addresses a broader range of issues such as validity, credibility and reliability with multiple measures of the same phenomenon (Yin, 2009).

Case studies that use multiple sources of evidence are more highly rated in terms of quality than those that use a single source of evidence (Yin, 2009). However the challenge of using multiple sources of evidence is the researcher's knowledge of the various data collection techniques. A lack of knowledge results in the loss of the invaluable advantage of case study strategy. Case study research has been criticized for a lack of control by the researcher and difficulty to access the case organisation. In addition it requires more time from the researcher as it takes time to get access and analyze the text data. The researcher's extent of control over events and access to actual behavioral events determine the suitability of the research method (Yin, 2009). The case study research method has been found suitable to examine contemporary events without manipulating behaviors and using multiple data collecting techniques (Yin, 2009).

#### **4.4.2 Case Study Selection**

The research used purposive sampling in order to select data collection units that yielded the most relevant and broad range of perspectives and information of the research area (Yin, 2011). The research site was purposefully selected to help the researcher to understand the problem of IT adoption decision making in organisations (Creswell, 2009). In order to boost the confidence of the study in terms of breadth and in-depth data collection, 90 data collection units were selected using purposive sampling, which reflected the diversity of the composition of the groups so as to protect undesirable biases and rival explanations.

Creswell (2009) highlights the view that the methodology and methods used to carry out the research have an influence on the research results. Two companies agreed to participate in the study from six which were approached by the researcher. Data was gathered about participants' perceptions on IT adoption decision making in organisations. In order to understand how decisions are made on IT adoption in the organisation, it was necessary to understand the view point of the participants on how decisions are made within the

organisation. The factors that influence decision making in each organisation were examined. The strength of the case study lies in its potential to provide in-depth insights and establish rapport with the research subjects (Remenyi & Money, 2004). The profiles of the companies that were studied are provided in Tables 4.2 and 4.3. The selected organisations were from different industries and large in size. The two factors were important to get a diversity of views in terms of industries and participants (Yin, 2009). The names of the companies cannot be revealed due to the confidentiality clause. However the supervisor and the ethical committee know the companies as they provided acceptance letters to participate in the study as part of ethical clearance.

Table 4.1: Company A: Profile

<b>Attribute</b>	<b>Profile Company A: Retail Distribution</b>
<b>Background</b>	Company A: a major logistic, distribution and warehouse company in South Africa and neighboring countries. The company provides warehouse and distribution services to many manufacturing companies in South Africa. The company employee more than 1 500 staff and has national coverage through agents in other regions. Distribution and warehousing are the core services of the company.
<b>Values</b>	The company is committed to positively impact people through corporate social responsibility which includes HIV and Aids initiatives
<b>Mission</b>	The company's mission is to be the market leader in the fast consumer moving goods (FMCG) logistic, distribution and warehousing in Southern Africa.
<b>Vision</b>	The company will achieve their mission through leveraging their core competencies in logistics, distribution and warehouse services. The company's state of the art warehouse management system is essential to its success as a third party distribution and warehouse service provider. Distribution is important in the supply chain in connecting the supplier and the customers. The warehousing services provide an important link to the supply chain services
<b>Business Reason</b>	The company aims to be the best third party FMCG supply chain management company in Southern Africa. Leveraging their national infrastructure, it promises to provide customers with a cost effective and

	flexible distribution and warehousing solution for the Southern African market. The managed distribution and warehouse of customer products enable them to concentrate on their core competencies
<b>Reason for Selection</b>	The company has many IT users which is important to the research. The company has also many departments which will provide diversity of opinion to the research topic. IT is also core to the operation of the organisations. The company is in a different industry from the second company.

Table 4.2: Company B: Profile

<b>Attribute</b>	<b>Profile Company B: Manufacturing</b>
<b>Background</b>	Company B was established in 1994. It is a global leader in security systems with a market share of over 10 percent in the global market. The company has presence in all continents in 70 countries. The company has a staff complement of over 43 000 globally. The company is listed on the Stockholm stock exchange. The company has a diverse product range to meet the security needs of different industries which include electro-mechanical and electronic security systems.
<b>Values</b>	The company thrives to be a good citizen through corporate social responsibility (CSR).
<b>Mission</b>	The company's mission is to spearhead the trend towards higher security with a product offering centered on the customer's needs. The company's strong development is based on the long term structural growth in demand in the mature market. The mission is divided into three areas, market presences, product leadership and cost efficiency.
<b>Vision</b>	The company's vision is to be the world leader in the security solution market. The company needs to be leader in innovation security solutions that create added value to its customers. The company wants to be an attractive company to its employees through initiatives such as career development, training, and priority to internal recruitment and BEE plans.
<b>Business Reason</b>	The company has specialized knowledge in the security industry which includes mechanical locks, security doors, electromechanical and electronic locks, access controls, identification technology and entrance automation. The company's product portfolio has expanded and evolved to cover the

	widely varying needs of different industries. The most salient is the global increase in prosperity and urbanization which have led to new construction and an increased demand for doors, locks and access control systems.
<b>Reason for selection</b>	The company is heavily dependent on IT for its day to day operations. In addition, the company has several departments which are important to have a diversity of options from a wide range of participants. The company is also in a different industry from the first selected company for the study.

Yin (2009) points out the need for careful investigation before selecting the case study to reduce chances of misrepresentation and problems of inaccessibility. The research used two organisations to answer the research questions. The basis for selecting the two organisations for the research was diversity and appropriateness of cases. In addition, the two organisations were extreme cases in terms of the number of departments in the organisation which increased the diversity of stakeholders who were involved IT adoption. The IT adoption was a typical process in organisations where lessons learned from one organisation may be important to similar organisations.

#### **4.4.3 Theory Building using Case Studies**

Myers (2009) points to the need for the research to contribute to the knowledge through convincing empirical evidence for other researchers. Yin (2009) points out that case study research is useful for creating knowledge about organisational life and provides a holistic approach to real life events such as managerial and organisational processes such as IT adoption decision making. The case study research differs from other methods on the role to develop theory before conducting any data collection (Yin, 2009). From a case study perspective, theory development is part of the design phase. Yin (2009) points out that theory development before data collection is important for case study research as it clarifies what is being studied and guides what data to be collected and informs data analysis strategies. One way of theory development in case studies is a literature review of the related studies (Yin, 2009). The literature review can focus on related types of literature from previous studies such as information technology adoption and decision making.

Case studies have been found to be suitable for creating theory and testing existing theory from one or more cases (Yin, 2011). Although case studies are viewed as subjective the researcher's closeness to data makes it suitable for theory building and its strength is its

ability to produce accurate theory from participants involved. Case study research assists to develop theory which can be applied in other situations, possibly using another research strategy (Oates, 2009). In addition to assisting with the data collection design phase, theory development provides the basis for generalizing the case study results. The case study research strategy was found suitable for the validation of the preliminary IT adoption governance framework as it allowed the participants who responded to the quantitative phase to be selected for the second qualitative interview phase. In order to use the same participants for the quantitative and qualitative the case study was found to be the most appropriate to validate the preliminary IT adoption governance framework to assist organisations with IT adoption decision making.

#### **4.4.4 Evaluating Case Study Research**

The case study research method has been criticized for lack of rigour due to lack of systematic procedures. The inferiority of case study research can also be due to its being mistakenly associated with case study teaching (Yin, 2009). Case study research has been also criticized for lack of scientific generalization. Yin (2009) points out that the goal of case study research is not statistical generalization but analytical generalization (to expand and generalize theories). Case studies can be generalized to theoretical propositions and not to populations or universe (Yin, 2009). Researchers have been advised to evaluate case study research based on its fundamental tenets as opposed to using criteria for other methods (Myers, 2009).

Myers (2009) points out that many researchers make the mistake of thinking that more case studies increase the validity of the research findings. Case study research is not based on sampling logic and statistical methods applicable to surveys. The notion of sample size to reflect on the whole population is not applicable to case study research. The statistical terms such as confidence level and intervals does not mean much to case study research in which more cases are not better than one (Myers, 2009). In addition the case study sample sizes are small and not based on random samples (Myers, 2009). Yin (2011) points out that case study research can be generalized to theory, not to sample population. Single case study generalization is possible in the same way as a single experiment is (Myers, 2009). Having discussed the case study research strategy, the next section discusses the research methods.

#### **4.5 Research Methods**

Traditionally the most common categories of research methods in information systems (IS)

are quantitative and qualitative (Creswell, 2003; Oates, 2009). The two traditional research methods have been found to have limitations to particular research situations. While the quantitative method (questionnaires surveys) has been found to be economical and efficient in collecting large samples of data, it has weaknesses in investigating social contexts associated with organisations. The qualitative method has been found to be suitable for investigating complex social phenomenon using interviews but has been found to be time-consuming and difficult to use to cover a large group of participants (Morse & Niehaus, 2009; Peng, Nunes & Annansingh, 2011).

The limitation of the individual traditional approach can therefore be addressed by adopting a mixed methods approach as one approach's weakness is complemented by the other approach's strength thereby providing richer high quality research findings in a single research design (Peng, Nunes & Annansingh, 2011; Riffle et al., 2013; Pssini, Pihet & Favez, 2013). Mixed methods research helps researchers to design a better research inquiry about a phenomenon than a single method. Venkatesh et al., (2013) add that although mixed methods research can provide deeper insight in a research inquiry than a single method, not all research inquiries are expected to employ a mixed methods approach. Venkatesh et al., (2013) argue that a mixed methods research approach is no substitute for conducting rigorous single method research inquiry.

#### **4.5.1 Mixed Methods Research**

Mixed methods research was found suitable for the study as it yields holistic and richer findings to the complex IT adoption decision making in organisations. Mixed methods research helped to resolve the limitation of using a single method design to understand IT adoption decision making in organisations. In addition, mixed methods research helped to make validation of the results of the IT adoption governance framework more credible. The selection of the research method was, therefore, determined by the research question and objectives.

Creswell (2005) defines a mixed methods research approach as a procedure of mixing or integrating qualitative and quantitative methods, data collection and analysis in a single study in order to better understand the research problem. To address the research problem, this study used a mixed methods research approach which is a procedure for collecting, analysing and mixing or integrating both quantitative and qualitative data at some stage of the research process within a single study (Creswell, 2005; Mertens, 2009). The mixing that happens at



different stages (design, data collection, and analysis stages) is at the core of mixed methods research (Fidel, 2008; Morse et al., 2009; Wiggins et al., 2013).

Venkatesh et al., (2013) note the existence of three paradigms for mixed methods research (namely, pragmatism, transformative-emancipatory and critical realism). Some researchers suggest that pragmatism is the most suitable paradigm for justifying the use of mixed methods research (Teddlie & Tashakkori, 2010; Greene, 2006). The pragmatic approach supports both positivist, (quantitative) and interpretivist (qualitative) approaches in the same research study as part of abduction reasoning. According to pragmatism, the research question dictates the selection of the method and paradigm to be used in the research inquiry. On that note, pragmatism provides a practical way of applying mixed methods research in a research project (Peng et al., 2011; Venkatesh et al., 2013).

The transformative-emancipatory paradigm is based on the need to create a more just and democratic society using research inquiry. It is motivated by the need to reduce discrimination and oppression through promoting social equity and justice using research enquiry (Mertens, 2003). Critical realism does not believe in obsolete truth as it supports a combination of different research methods in a single research inquiry to gain better in-depth understanding of a phenomenon of interest (Mertens, 2007; Venkatesh et al., 2013). Venkatesh et al., (2013) suggest the paradigm should not to be an obstacle to conducting mixed methods research but focus should be placed on answering the research questions and developing substantive theory for various IS phenomena through blending of paradigmatic views through conducting rigorous mixed methods research.

The mixed methods research is a means to resolve widely perceived inherent limitations of a single method design to complex research problem (Peng et al., 2011; Waltz, 2014). The mixed methods research is expected to yield holistic and richer findings to complex phenomena than a single method research. Information systems (IS) researchers have been urged to consider mixed methods research to address complex research questions associated with information systems (Peng et al., 2011; Castella, Ragazzia & Cattaneo, 2014).

Creswell et al. (2011) maintain that worldview in mixed methods research changes during a research study, based on the type of design (sequential exploratory or explanatory) and the project phase. Mixed methods research which is part of methodological pluralism allows both positivist and interpretivist epistemologies in a single research inquiry. Mixed methods

research, which is the third paradigm, employs quantitative and qualitative research methods in a single research inquiry through promoting methodological diversity in IS research inquiry.

#### **4.5.2 Mixed Methods Research Rationale**

Most researchers concede that research question, objectives and context must be the main drivers of the selection of the mixed methods research approach (Creswell & Clark 2007; Ridenour & Newman, 2008; and Teddlie & Tashakkori, 2009). The mixed methods research purposes are important in assessing the suitability of the approach and the research design. The main benefit of employing a mixed methods research approach to IT adoption is to provide holistic understanding to a fragmented, inconclusive and equivocal phenomenon. On that note, it is important that the selection of the method is based on the phenomenon's context. The mixed methods research rationale is that no single research method is sufficient by itself to capture the breadth and depth of a complex situation such as IT adoption decision making in organisations.

When two methods (qualitative and quantitative) are used in combination they complement each other and provide a more complete picture of the research phenomenon (Teddlie et al., 2009; Wooten et al., 2013). The mixed methods research rationale is that it optimizes the sample (participant enrichment), maximizes the research instruments, enhances fidelity of instruments, programs or treatments and maximizes the interpretation of the findings (Leech & Onwegbuzie, 2010). Mixed methods research benefits come from capitalizing on the strength of quantitative research and reinforcing with the techniques of qualitative research.

Mixed methods research's assumption is that the choice of method is dependent on the research question under investigation as some questions are best understood through the combination of both qualitative and quantitative data as part of abductive reasoning (deductive and inductive approaches) (Locke, 2007; Venkatesh et al., 2013). Mixed methods research supports inter-subjectivity in understanding based on shared meaning, encouraging developing and testing intuitions theoretically and empirically (either qualitative or quantitative or a mix of both). Mixed methods research allows multiple paths to meaning and provides an important way to conceive meaning based on abductive reasoning to produce robust measures of association (Venkatesh et al., 2013). Mixed methods research provides an escape from the trap of a researcher seeing research as a single design (quantitative or qualitative) instead of benefiting from the best of both worlds.

Miles and Huberman (2002) contend that entertaining mixed methods rather than remaining on single design helps quantitative and qualitative inquiries to inform each other in many important ways. Mixed methods research is seen as valuable as it provides new ways of thinking about the world from a social science research perspective (Morgan, 2007). The flexibility of mixed methods research is its ability to view theories or conceptual frameworks and testing from both deductive and inductive (testing and developing theory) viewpoints. Mixed methods research may use quantitative approaches to identify individuals to interview based on the analysis of the numerical data (Venkatesh et al., 2013).

In addition quantitative research can be useful to cover a bigger population whereas the qualitative approach provides depth to the phenomenon. Creswell & Plano Clark, (2007) say “mixed methods research involves the mixture of qualitative and quantitative approaches in the collection and analysis of data”. The mixed methods research has an advantage of providing a better understanding of research problems as it combines the validity of lived experience and perception (qualitative approaches) with reliability of counts (quantitative approach) (Johnson et al., 2004). The benefit of mixed methods research is its ability to offer results greater than the sum of quantitative and qualitative approaches (Venkatesh et al., 2013). This is achieved by using quantitative methods to achieve generalizability of the findings and qualitative to contextualize the findings. The argument for mixed methods research is that it offsets the weaknesses of qualitative and quantitative research. The weakness of quantitative research is in understanding the context and the participant’s voices (Venkatesh et al., 2013). These weaknesses are addressed by qualitative research. The weakness of qualitative research is its difficulty in generalizing findings because of the small sample size and the bias of interpretation of the research (Venkatesh et al., 2013).

Mixed methods research removes the restriction of using only certain types of tools for data collection associated with a single method (Teddlie et al., 2009). The mixed methods research provides a solution to research questions which quantitative and qualitative research cannot satisfactorily answer alone. This is the case where exploring is required before doing the experiment of the study. Mixed methods research provides an opportunity for collaboration in inquiry for qualitative and quantitative researchers (Venkatesh et al., 2013). Mixed methods research allows the researcher to use all available methods to address a research problem using both numbers (deductive) and words (inductive) thinking to solve problems (Creswell et al., 2011). Mixed methods research is useful in understanding the world which is both

social and natural in nature which needs the use of both words and numbers to present a full picture of the phenomenon.

Creswell et al. (2011) highlight that mixed methods are suitable for research problems where one data source may be insufficient to provide conclusive results. The mixed methods help in explaining and exploring the research problem under study. In mixed methods research the quantitative phase will provide a general understanding of the problem which can be generalized whereas the qualitative interview phase provides greater depth to the understanding of the problem. The use of only qualitative methods may result in loss of ability to generalize and the use of only quantitative methods may result in a diminishing of understanding of any one individual (Brannen, 2005; Creswell et al., 2011).

#### **4.5.3 Mixed Methods Research Strengths**

Creswell et al. (2011) highlight that a situation where one data source is inadequate or where one type of data fail to provide a complete story resulting in lack of confidence in the evidence are suitable for mixed methods research. In many case results from different levels of an organisation differ or are contradictory to each other resulting in inconclusivity. The qualitative method in mixed methods study has been found useful for further explanation of quantitative results as to what they mean (Fielding & Fielding, 2008; Creswell et al., 2011).

The strength of the mixed methods design is to explore and fully explain the IT adoption governance challenges in organisations not possible with a single approach (Fidel, 2008; Creswell et al., 2011). The triangulation of mixed methods helps reduce bias, improve confidence with results, and stimulates innovation and richness of the research findings. The mixed methods research allows more holistic exploration of IT adoption issues in organisations which are political, economic, social and technological than a single method design approach. Creswell et al. (2011) warns that poor design of mixed methods research may result in loss of value and meaning of the research.

In mixed methods research where the qualitative data has been used in the first phase, the quantitative is important to generalize and test what was learned from the exploration qualitative phase. In other mixed methods research, one method is embedded in the dominant method to provide an understanding of the research problem. Creswell et al. (2011) also concede that situations exist in mixed methods research in which data collected build on from one method to the other in order to understand the research problem. Creswell et al. (2011)

maintain that multi-projects which span several years in most cases require the mixed methods research design to connect several studies to reach an overall objective.

Qualitative research's strength is in understanding the context and setting in which participants talk and capturing their voices (Creswell et al., 2011). Its weaknesses are in generalizing the findings to a population and biases of the researcher's personal interpretation. The qualitative approach weaknesses can be offset by the quantitative approach whose weakness is in understanding the context. Mixed methods research helps one approach to make up for the weakness of the other approach (Creswell et al., 2011). Mixed methods research removes the restriction on data collection tools available to the researcher. The unrestricting of the research tools provides more evidence on a research problem than the use of one approach. Hence the mixed methods research approach helps to answer questions that cannot be answered by a single approach and together they provide a satisfactory answer (Creswell et al., 2011).

The quantitative and qualitative adversary divide only serves to narrow the choices of approaches available to the researcher. Mixed methods research removes the barrier of methods adversaries as it provides a bridge for use of multiple paradigms (worldviews) as part of pragmatism (Creswell et al., 2011). Mixed methods research is practical in that it allows researchers to use all methods (both number and words) to address a research problem. The use of inductive (text data) and deductive (number) thinking is encouraged for understanding the world in mixed methods research (Swanson & Holton, 2005; Creswell et al., 2011).

The rationale of using mixed methods research is to address the research question which cannot be addressed by a single research approach on its own but needs both research methods (Venkatesh et al., 2013). The mixed methods research allows the triangulation of ideas to enhance the validity of the findings as the complementarity of two methods ensures that the results are more valid than they would have been with one research method.

#### **4.5.4 Mixed Methods Research in Information Systems (IS)**

The interdisciplinary nature of IS means that it includes different disciplines and paradigms making it necessary to use a mixed methods research approach (Peng et al., 2011; Venkatesh et al., 2013). The interdisciplinary nature of the IS discipline (IT and business) makes it appropriate to consider mixed methods research (Warfield, 2010; Venkatesh et al., 2013). The

suitability of mixed methods research in Information Systems is based on the fact that some aspects are found in the scientific method which requires quantitative methods and other aspects are associated with social sciences which require qualitative methods (Warfield, 2010; Venkatesh et al., 2013).

Although mixed methods research has received much attention in other disciplines like social science it has been suggested that Information System can also benefit because of its interdisciplinary nature (Venkatesh, 2006; Tashakkori & Creswell, 2008; Warfield, 2010). The mixed methods research represents an evolution of research methodologies as a solution to research situations which require a combination of quantitative and qualitative research. The diversity and complexity of IS may require the combination of quantitative and qualitative research methods. Information systems research as a discipline uses theories from both social sciences (qualitative) and natural sciences (quantitative) to understand the phenomenon (Warfield, 2010; Venkatesh et al., 2013). The issue of research relevance and justification has been a major debate between practitioners and academics in the IS literature. The argument has been that justification has a positivist perspective of natural science whereas relevance has an interpretive perspective of the social science (Venkatesh et al., 2013).

The positivist approach of natural science has been criticized for paying more attention to the theory than practical research which is relevant to IS practitioners. The interpretive and mixed methods research has therefore potential to add insight into issues of IS research diversity of application to practice, which is not possible with a positivist view (Warfield, 2010; Venkatesh et al., 2013). The use of social science theories from other fields such as psychology and organisation behaviour fits well with the IS/IT human element (Venkatesh et al., 2013).

Many researchers concur that mixed methods research is useful to understand and explain complex organisational and social phenomena such IT adoption in organisations (Peng et al., 2011; Cao et al., 2006; Venkatesh et al., 2013). The use of mixed methods research in information systems, which was dominated by quantitative methods, is likely to add rigour and validity of research. Mixed methods research helps improve the validity of the research through triangulation and convergence of multiple and different sources of information (Venkatesh et al., 2013). Mixed methods research provides an opportunity for flexible and innovative use of triangulation in IS research.

The mixed methods research may help researchers to understand the complexity and challenges related to IS in organisations which are constantly changing. The existing single research method approach may be insufficient to explain the challenges of rapidly changing IT environments in organisations (Venkatesh et al., 2013). Mixed methods research may be a solution where single existing theories do not sufficiently provide insight into a complex phenomenon like IT adoption in organisations. Mixed methods research design has been seen to provide a solution to deal with situations that may not be resolved with a single research method and can make contributions to theory and practice (Venkatesh et al., 2013).

Investigation of IT adoption decision making in organisations is an ideal phenomenon to use a mixed methods approach because of fragmented, inconclusive and equivocal phenomenon in literature. Although there has been much research on the phenomenon, most of the findings remained inconclusive because of the complexity of IT adoption decision making (Venkatesh et al., 2013). Mixed methods research offers a holistic view of IT adoption in organisations from different stakeholders' perspectives. The mixed methods research is suitable for developing and evaluating IT adoption governance framework in organisations (Venkatesh et al., 2013).

The leveraging of two different research methods in one research inquiry helps to improve the understanding of IT adoption decision making in organisations. It is important for the IS researcher to find a fit for purpose of research questions, objectives and context of the mixed methods study to achieve appropriateness. Venkatesh et al. (2013) suggest that a substantive theory stance is a valid and powerful paradigmatic position for mixed methods research in IS due to the nature of the field and the need to develop novel theoretical perspectives. While mixed methods research has all these advantages, it is not easy to conduct as it needs a lot of resources and is time consuming (Venkatesh et al., 2013). In addition to that it requires the researcher to have skills in both quantitative and qualitative inquiry. However the benefits of mixed methods seem to overweight the difficulty of the approach.

#### **4.5.5 Mixed Methods Research Purposes**

The benefits of a mixed methods approach are not always obvious as it serves various purposes in a research inquiry. The purposes for mixed methods research include complementary, expansion, corroboration/confirmation, compensation and diversity (Tashakkori & Teddlie, 2008). The main purposes of mixed methods research designs are complementary (combination of results) developmental (results from one informs the other),

initiation (results questions other results) and expansion (where results extend breadth and range of inquiry). The researcher needs to explain the purpose of using mixed methods research based on the above mentioned purposes. The mixed methods research must serve one or more purposes in a research inquiry. Researchers need to be aware of the different purposes served by the mixed methods research.

The clear understanding of the research purposes helps to make informed decisions on the mixed methods design and analysis. The researcher's appreciation of mixed methods approach purposes may be important in understanding the goals and outcomes of the research inquiry. Completeness purpose in mixed methods research provides a holistic view of the phenomenon that cannot be achieved by one approach. Developmental purpose is associated more with a sequential mixed methods approach than a concurrent approach (Tashakkori & Teddlie, 2008). The research done by Venkatesh et al. (2013) shows that completeness and developmental are the most common purposes for conducting mixed methods research.

It is also important for the researcher to understand whether mixing quantitative and qualitative methods are appropriate in research inquiry (Tashakkori & Teddlie, 2008; Morse & Niehaus, 2009). Researchers using mixed methods research need to be reminded about paradigmatic challenges associated with the method. In the study by Venkatesh et al. (2013) the most common data collection methods for quantitative and qualitative research studies were surveys and interviews. In most cases the quantitative research approach was found to be the most dominant in IS mixed methods research papers (Venkatesh et al., 2010).

#### **4.5.6 Mixed Methods Research Design**

There are several types and approaches of mixed methods research which have a benefit from the use of both qualitative and quantitative approaches to data analysis and the measurement of meaning. Some of the issues to consider in mixed methods approaches are the timing and ordering of the methods in the study (Morse & Niehaus, 2009). The ordering can be simultaneous (same time) or sequential (different periods). Mixed methods research strategy (design) can be concurrent (each method independent of each other) or sequential (findings from one method or paradigm inform the other) to understand a phenomenon (Ivankova & Stick, 2007; Tashakkori & Teddlie, 2008).

The most common types of mixed methods designs are sequential explanatory, sequential exploratory, concurrent triangulation, sequential transformative, concurrent transformative



and concurrent nested design (Creswell, 2003; Morse et al., 2009). Many researchers appreciate the mixed methods research's multiple worldview to provide a holistic view to phenomena of interest such as IT adoption decision making in organisations. Many researchers have used surveys (quantitative) and an interview (qualitative) to collect data about new IS implementation in organisations. Hence there have been many researches that combine qualitative and quantitative methods to understand the same phenomenon (Ivankova & Stick, 2007; Venkatesh et al., 2013).

The mixed methods research enabled the researcher to simultaneously explore and confirm questions thereby accomplishing two goals (generating and verifying theory) in the same study. The mixed methods research demonstrates the predictive effect of independent variables on dependent variables and answers the how and why part of an explanatory questions. Some research studies cannot be conducted conclusively using one method to test and explore in greater depth relationships of variables.

#### **4.5.7 Sequential Explanatory Mixed Methods Design**

This research used a sequential explanatory mixed methods design which is a two phase approach for quantitative data collection and analysis before qualitative data collection and analysis to further explore and expand the research findings (Ivankova & Stick, 2007; Peng et al., 2011). The sequential explanatory mixed methods design consists of two phases where quantitative data is collected and analyzed in the first phase before qualitative data is collected and analyzed in the second phase. The first quantitative phase of the study helped to identify the potential predictive power of variables of the preliminary IT adoption governance framework and to purposefully select the participants for the second qualitative phase as shown in Figure 4.2. The second qualitative phase of the study helped to explain or elaborate on quantitative results obtained in the first quantitative phase.

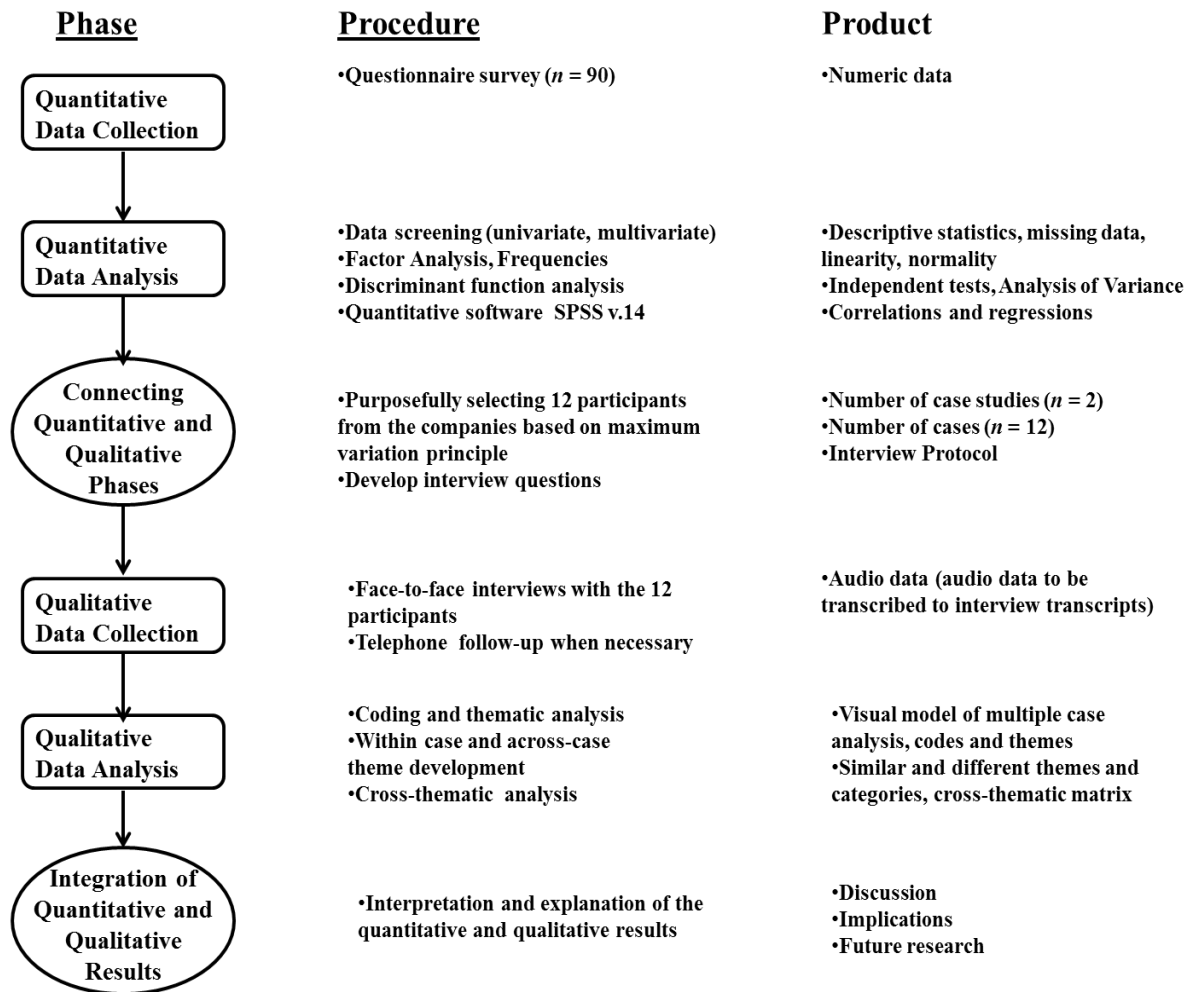


Figure 4.2: Visual Model for Mixed-Methods Sequential Explanatory Design Procedures (Source: adapted from Ivankova & Stick, 2007 p.98)

The sequential explanatory strategy appeals most to researchers with strong quantitative backgrounds and interests (Venkatesh et al., 2013). The sequential explanatory mixed methods design is useful in cases where one method may not be sufficient to give conclusive results on the research area. The results from the quantitative phase helped to select the samples of the qualitative study. The qualitative data from the interviews can be used to explain the quantitative results from a survey in a two phase approach to data collection. Certain participants who had extreme answers to certain questions would be interviewed about their perception to get more in- depth knowledge of the phenomenon. The drawback of the sequential explanatory mixed methods design is that it is time consuming because of its two sequential phased approaches.

The importance of the sequential explanatory mixed methods research design is that it allows the general understanding of the research problem using quantitative data before allowing explanation and exploration of the statistical results using the qualitative method (Creswell, 2005). The sequential mixed methods research strategy helps to understand the complex phenomenon of IT adoption decision making in organisations. The sequential mixed methods design has separate sequential phases of quantitative and qualitative data collection and analysis phases. In line with the research objectives of developing and validating IT adoption governance framework the finding of the quantitative study informs the qualitative study.

Since the objective of the research is to develop and validate a framework for IT adoption governance in an organisations, a sequential approach based on a quantitative approach (large sample of participants for breadth) followed by a qualitative approach (interviews for depth) was appropriate. Since there is a strong theoretical foundation on IT adoption decision making with fragmented and inconclusive findings, this research conducted a quantitative study followed by a qualitative study to offer an in-depth insight based on the context-specific findings of reasons for fragmented and inconclusive results from previous studies. The main motivation of the sequential research design was to leverage the quantitative results from the quantitative phase to inform the qualitative phase and add richness to the overall study. The mixed methods rationale is to overcome the weakness of a single approach to capture breadth and depth of a phenomenon which is achieved by the complementarities accorded by using both qualitative and quantitative data (Creswell, 2005). The next section discusses the quantitative data collection phase.

#### **4.6 Quantitative Data Collection Phase**

The organisations were approached through gatekeepers who were senior managers in the organisations. The first contact was done telephonically before an official letter was sent to the organisations. The approached organisations were from different industries which was important to achieve representativeness in the sample. As proof of acceptance by the organisation they had to respond in writing stating that they were willing to participate in the study under the terms and conditions stated to them by the researcher. The acceptance letters from the organisations were important in order to get ethical clearance from UNISA in order to commence the study. Four organisations withdrew from the study citing that they were too busy to participate in the study. The withdrawal affected the expected sample size. Some statistical analysis could not be done as the number of cases was not sufficient.

After the UNISA ethical clearance was finalised the gatekeepers in the organisations were given questionnaires to distribute to IT users in the organisations. The number of questionnaires was estimated by the gatekeepers as they had knowledge of the number of IT users. There was no sampling employed on selecting the respondents but the whole population of IT users in the organisation was accessed.

The questionnaire was pretested in the researcher's organisation to improve its quality. The organisation used was selected because of its easier accessibility to the researcher. Four staff members were selected who gave comments on the quality of the questionnaire. The identified concerns in the questionnaire were revised as a way of improving the instrument. All the questions that were not clear during the pre-testing phase were revised before the main study commenced.

The study used both quantitative and qualitative data to validate the preliminary IT adoption governance framework to assist organisations with IT adoption decision making. The quantitative questionnaires (APPENDIX: A) were seen as important to produce results that were generalizable to the particular context. The quantitative phase which used questionnaires was followed by qualitative interviews from purposefully selected participants from the first phase based on results from the quantitative phase. About 200 questionnaires were sent to gatekeepers in the two companies to distribute to all IT users. The questionnaires had pre-defined questions seeking participants' perceptions on an IT adoption governance framework.

About a hundred questionnaires were sent to each company and 90 valid questionnaires were returned from the two companies. The returned questionnaires represented a 45 percent response rate. The data collection, using questionnaires, took three months from April 2013 – June 2013. After the completion of data collection using questionnaires, data was coded and analysed to produce preliminary results important to inform the second qualitative interview phase of data collection. There was a gap of two months between the quantitative and qualitative data collection.

The researcher used frameworks constructs from the literature to construct the questionnaire for the quantitative phase. The questionnaire variables were constructed from the constructs used to develop the proposed IT adoption governance framework. The sociological paradigm sub-components were combined to make one construct - the sociological paradigm - since the sub-components were closely related to systems approach sub-components. A five point

Likert scale was used to develop the questionnaire with a range, 1 = strongly disagree and 5 = strongly agree. The questionnaire was pre-tested with a few participants to refine the questions. Quantitative data from the questionnaires was captured and analyzed using SPSS (Statistical Package for the Social Science) version 8.0.

#### 4.6.1 Guideline of Sample Size

Van Voorhis and Morgan (2007) contend that unlike qualitative research, which does not have an agreed sample size, quantitative research offers guidelines on sample sizes needed for different statistical procedures. This means that every quantitative statistical procedure has rules in terms of sample size (see Table 4.3). Most researchers propose that statistics for detecting differences between or among groups (t-tests, ANOVA) require 30 participants per cell to achieve the minimum suggested power for an ordinary study (Cohen, 1988; Morse, 2000; Ross, 2004). The general rule of thumb for statistics used to examine relationship (correlation and regression) is 50 and above participants (Cohen, 1988; Van Voorhis, 2007; Delice, 2010). Some researchers suggest a formula based on the number of independent variables (Green, 1991; Delice, 2010). Chi-square, which tests the independence of category variables, requires at least 20 overall with no cell smaller than 5. Factor analysis requires at least a 300 sample size with 50 participants per factor. The sample size of 90 cases was therefore found to adequate for validating the preliminary IT adoption governance framework.

Table 4.3 Sample size rules of thumb (Adapted from Van Voorhis and Morgan, 2007)

Relationship	Reasonable Sample Size
Measuring group differences (e.g. t-test, ANOVA)	Cell size of 30 for 80% power, if decreased , not lower than 7%
Relationships (e.g. Correlations, regression)	50 and above
Chi-square	At least 20 overall, no cell smaller than 5
Factor Analysis	300 is good

#### 4.6.2 Reliability Test

The questionnaire constructs (themes) were tested using Cronbach's alpha values to see if they were reliable and acceptable. Reliability of the variables was tested using Cronbach alpha and the unreliable variables were dropped before computing the scores of the construct variables (see Table 4.4. The Cronbach's alpha used averages to test reliability of constructs.

The reliability of an instrument refers to its consistency each time it is used to measure the same subject under same conditions (Nunnally, 1978). The Cronbach's alpha values are interpreted as good with reliability above 0.8, acceptable reliability when between 0.6 and 0.8, unacceptable reliability below 0.6. However some authors' cut off for acceptable reliability is 0.7 (Nunnally, 1978).

Table 4.4: Cronbach Alpha Reliability Test

Construct	Item	Item left	Mean	SD	Cronbach	Reliability
TAM	B1-B10	None	4.22	.616	0.93	Good
IT Governance	C1-C10	C7,C10	3.01	.708	0.90	Good
Stakeholders Participation	D1-D10	D8	3.47	.608	0.85	Good
Sociological Paradigms	E1-E10	E9	3.90	.528	0.81	Good
Hard Systems Thinking	F1-F10	F8,F10	3.36	.620	0.83	Good
Soft Systems Thinking	G1-G10	None	3.83	.561	0.88	Good
Emancipatory Systems	H1-H10	H1	3.87	.539	0.84	Good
Critical Systems Thinking	I1-I10		3.76	.603	0.89	Good

Note: (n=90)

Certain items were removed from the index after they correlated badly to improve the reliability of the index. Items with less than 2 percent alpha Cronbach were removed from the set. The Table 4.4 shows the reliability results from the questionnaire constructs. The table shows from left to right construct, items included, items left out, mean, SD, Cronbach Alpha value and reliability interpretation. The Table 4.4 shows that all the questionnaire constructs were above 0.80 which is an indication of good reliability for all the constructs.

#### 4.6.3 Quantitative Data Analysis

The descriptive statistics used include frequency tables, means, standard deviation and correlations to provide summarized data for discovering trends and patterns (Teddlie et al., 2009). Descriptive statistics were used to obtain summary indicators from numeric data to describe variable relationships within groups. The descriptive statistics were not sufficient to make inferences about the sample data and hence the need to use inferential statistics methods.

Teddlie et al. (2009) concur that inferential statistics, which are normally generated after

descriptive statistics, are used to confirm or disconfirm descriptive results. Inferential statistics were used to make inferences from sample data include testing group means, relationships between variables and estimating the degree of error on inferences. Inferential statistics were used to find differences between groups and relationships between variables (Teddle et al., 2009). Significance test between group means and multiple regression analysis helped to determine the degree of the relationships between variables.

Univariate statistics were used to test dependent (predicted) variables with predictor (independent) variables as part of answering the research question. Preliminary assumption testing was conducted to test for normality, linearity, outliers, homogeneity of variance with no serious violations noted. Multivariate statistics were used to test relationship between predicted (dependent) variables before the univariate statistics were used to determine relationships between variables and differences between group means. A one way between group multivariate analysis of variance was done with seven constructs as dependent variables after being scored to five points.

The independent variables were selected from the demographic variables. The participants' demographic characteristics such as age, gender and education were the independent variables and the preliminary IT adoption governance framework constructs were the independent variables. Correlations and regression were also conducted with IT governance being the dependent and other constructs independent variables. The correlation and regression analysis was conducted to find the relationships and predictor power of other constructs to the independent variable, IT governance. Having discussed the quantitative data collection phase, the next section discusses the qualitative data collection phase.

#### **4.7 Qualitative Data Collection Phase**

The qualitative interview data collection phase took place from September 2013 to October 2013 after preliminary results from the quantitative phase. Many researchers consider qualitative research for its ability to do in-depth investigations on a broad range of research topics (Oates, 2009; Yin, 2011; Creswell, 2009). Unlike quantitative research, qualitative research offers great latitude in selecting research topics without constraints such as research conditions (experiment), unavailability of sufficient data (survey) or adequate sample and studying the past (Yin, 2011). The flexibility of qualitative research has made it an acceptable form of research in different research fields (Yin, 2011). Yin (2011) notes that qualitative

research affords the opportunity to study human beings under-real world conditions through what they say. Open ended questions have been found more suitable for qualitative research as they allow participants to share their views with the researcher.

Qualitative research focuses on exploring and understanding human social problems. Since human beings have the ability to talk their behavior and actions are understood by talking to them. The qualitative research process involves the emergence of research questions, strategies for collecting sources of evidence from participants, data analysis and interpretation of the meaning of data (Creswell, 2009). The major strength of qualitative research is its ability to preserve text data from participants which helps understand their social context but is normally lost when using quantitative methods (Myers, 2009).

The qualitative research was found suitable to help understand what the participants say in their social context (Myers, 2009). The benefit of qualitative research was the opportunity to understand the reason for participants' different perceptions to the preliminary IT adoption governance framework. Humans as social beings, their actions and decisions in IT adoption in organisations (social context) can only be understood by talking to the people involved and affected (Myers, 2009). Qualitative research reveals participants' perspectives and views and not the meaning held by the researcher.

As such, qualitative research is based on the context within which people's lives take place which may influence human events. The objective of qualitative research is to develop concepts which explain a social process through interpretations. The qualitative research addressed the complexity of IT adoption decision making in organisations and the diversity of participants through use of multiple sources of evidence (triangulation) which added credibility and trust-worthiness of the research. The strength of qualitative research is its ability to focus on participants' meaning of real-life events not limited to the researcher's meanings (Oates, 2009; Yin, 2011). The important motive of the qualitative study was to study events in their real-world contexts in order to develop concepts (Myers, 2009; Yin, 2011). Yin (2011) points out that a researcher needs to acknowledge the existence of multiple interpretations (researchers and participants) in their final analysis. Yin (2011) adds that the possibility of multiple interpretations of the same phenomenon is not a constraint but an opportunity in qualitative research.



#### **4.7.1 Qualitative Sample Size**

Many questions have been asked if there is a formula to calculate the appropriate number of interviews. The question of how many interviews are enough in qualitative research has remained a thorny issue in the academic profession (Baker & Edwards, 2013). Most authors concur that the number of interviews depends on many factors (Flick, 2011; Bryman, 2012). Qualitative research has been contrasted with quantitative research which uses correlations to understand objectively what participants do (Baker & Edwards, 2013; Flick, 2011). Many researchers concur that the “how many” question is answered after reaching saturation and there is no need to continue (Flick, 2011; Baker & Edwards, 2013). Baker and Edwards (2013) suggest a sample of between 12 and 60 interviews as a guideline as the number is guided by the methodology and epistemology perspective. Other researchers suggest that interrogating the purpose of the research helps to decide the number of interviews (Flick, 2011; Bryman, 2012).

Baker and Edwards (2013) argue that the quality of analysis is important not just the quantity of interviews and in some cases one interview is enough for a qualitative research study. Many researchers state that qualitative researchers study a few people with more depth on the phenomenon (Baker & Edwards, 2013; Bryman, 2012). In many cases, it is not possible to know the number of interviews which needs to be done in advance. They noted that it is not always the number of interviews which is important but the presence of participants with relevant knowledge of the phenomenon. This is true when studying hard to access populations where between six and twelve participants may offer insight about the phenomenon (Flick, 2011). Most researchers concur that there is no rule of thumb as to how many interviews are enough for qualitative interviews (Charmaz, 2008; Flick, 2011; Bryman, 2012). In some cases it is not the sample size that is important but inclusion of a particular case (Baker and Edwards, 2013).

The increase in sample size does not necessarily increase the opportunity for addressing sample bias in that the method may not succeed in reaching the difficult ones; therefore purposefully sampling may be the answer. Baker and Edwards (2013) suggest a sample size of 12 to be sufficient in many cases although they indicate it can vary from one to hundred or more (Flick, 2011). Small (2009) note that reaching saturation in qualitative research is important to get depth on the full range of phenomena. Bryman (2012) suggests five factors to guide the number of qualitative interviews such as saturation, minimum requirements, and

theoretical underpinnings of the study, heterogeneity of the population, breadth and scope of research questions.

Bryman (2012) highlights the need to use the five factors to justify the sample size in qualitative interviews and the inferences possible with the sample size (Bryman, 2012, Leech and Onwugbuzie, 2010). Charmaz (2008) contends that the number of sufficient qualitative interviews is determined by the research purpose. Guest, Bunce and Johnson (2006) argue that twelve interviews are enough to get views and experiences from homogeneous people to generate themes. Charmaz (2008) points out that a big sample size does not guarantee the originality of a research contribution. Mixed methods research has been seen as one way to strengthen a study with a small interview sample. A small interview sample has been credited with depth and significance in a study.

#### **4.7.2 Selection of Qualitative Sample**

The participants of the second qualitative phase were selected based on the demographic characteristics of the participants and results from a first quantitative phase. The first quantitative analysis showed significant differences in some variables based on demographic characteristics such as gender, department, education and number of years in the organisation. Based on the demographic characteristics, twelve participants were purposefully selected from the two companies with assistance from the gatekeepers. The participants involved in the qualitative phase were drawn from diverse demographic characteristics such as gender, education, department and position. The qualitative second phase was used to explain why certain constructs had significant differences based on demographic characteristics.

In the qualitative interview phase, participants were selected using a stratified purposive sampling strategy to answer the research question. The purposive sampling was used to select a few participants who could provide valuable information related to the research question under study. The connection of the two phases was determined based on the results from the quantitative data analysis phase. The purpose of the qualitative phase was to explore in-depth the significant findings from the quantitative phase. An interview protocol was designed based on the significant variables from the quantitative analysis. The questions for the interview instrument were refined to answer inconclusive results emanating from the quantitative phase. The twelve interviews conducted were considered to be sufficient for the follow up to the quantitative phase. The interviews focused on areas which were inconclusive

in the quantitative phase as shown by the statistically significant results. The interviews therefore helped to uncover more in-depth information from the participants on why they differed in their responses on some of the constructs variables.

#### **4.7.3 Qualitative Interviews**

The choices of data collection techniques were influenced by the research problem and objectives. Researchers have been advised to use as many sources of evidence as possible for them to complement each other in a single case study (Yin, 2009). The researcher collected multiple sources of evidence in a natural setting using questionnaires, interviews and observation (Saunders et al., 2003; Creswell, 2009). The study predominantly used questionnaires and semi-structured interviews as the main data collection methods with other techniques as complementary. Although each research strategy contains one or more data collection methods, interviews are commonly used in case studies but can be used in other strategies too (Oates, 2009; Yin, 2009).

Myers (2009) contends that although case study data can be collected using a variety of techniques, interviews have been found to be the most suitable data collection technique for case study research in business. Interviews as a data collection technique can be classified into structured, unstructured and semi-structured. The semi-structured (qualitative) interview is the most commonly used in case study business research (Saunders et al., 2003; Myers, 2009). The strength of the interviews is the ability to gather rich data from diverse participants in different situations and permitting to view things not seldom seen (Myers, 2009). Interviews allowed the researcher to focus on the participants' worldview with regard to the preliminary IT adoption decision making and used the participants' language rather than imposing the researcher's own (Saunders et al., 2003; Yin, 2009). Since humans are able to speak, it was important to hear what they say with respect to their perceptions on IT adoption decision making in organisations.

The qualitative interviews involved face to face interviews with twelve participants drawn from different departments using open ended questions at the research site (Saunders et al., 2003; Creswell, 2009). The flexibility of interviews allowed the researcher to develop a social relationship with the participants in order for them to speak freely about IT adoption decision making in their organisations. IT adoption decision making as a complex sensitive subject requires an environment where participants speak freely. Interviews were conducted at a convenient place to permit participants to speak freely. Interviews were conducted with

management, end users and IT staff in the organisations focusing on their perception on IT adoption decision making. Before the interview process started, participants were asked to sign a consent form and an interview guide was used to guide the interview process. Interviews took approximately 60 minutes and afforded the collection of rich information with regard to participants' perceptions on the preliminary IT adoption governance framework.

Interviews were arranged with enough time between them to allow sufficient time to write up field notes and analyze before proceeding to the next data collection session (Saunders et al., 2003; Yin, 2009). A limited number of interviews were conducted per day in order to allow time during the evening to undertake some initial analysis before carrying out further interviews. This permitted the researcher to gather more in-depth data in the research area (Saunders et al., 2003; Myers, 2009). The researcher's ability to probe questions added depth to the data collection process. In order to achieve depth, the researcher interviewed participants from different departments in the organisations. Whilst key informants were important as a source of evidence with regard to decision making on IT adoption, their perspectives were treated with caution to avoid bias.

Researchers have been cautioned not to over depend on key informants as the only source of evidence as they may be biased (Saunders et al., 2003; Yin, 2009). The interviews afforded the researcher an opportunity to triangulate by interviewing a variety of participants representing different departments. Interviewing diverse participants allowed the widening of the breadth of perspectives since participants do not think alike, and reduced elite bias. The researcher used the interview guide (APPENDIX: B) when talking to participants as well as mirroring, which involved using phrases and words from respondents as a way to focus on the participant's world and language.

In addition, with participants' consent, the interviews were tape recorded to help keep the exact words spoken by the participants for thesis writing. The tape recording did not substitute listening throughout the interview process and was supplemented by taking notes. The qualitative data which was in audio form was transcribed into narrative text data in preparation for analysis by converting the text data into partially processed data which was then coded (APPENDIX: G). Using audiotape to record interviews has been found useful to capture words as spoken by the participants (Saunders et al., 2003; Yin, 2009). The researcher kept the recorded tapes away from the public as part of the confidentiality clause. Myers

(2009) highlights the challenges associated with interviews such as artificiality, lack of trust, lack of time, lack of entry, elite bias and ambiguity.

#### **4.7.4 Qualitative Data Analysis**

Interview data from recorded tapes was transcribed verbatim to a paper for analysis purposes. The qualitative phase used an inductive data analysis approach to organizing data into patterns of categories and themes in order to let data lead to the emergence of concepts (Locke, 2007; Creswell, 2009). The inductive process is the most common for generating meaning from data in qualitative research. The inductive analysis involved arguing from particular facts or data to generate general themes (Teddlie et al., 2009). Thematic analysis was used to analyze the data before coding and categorizing into themes. Thematic analysis helped to classify narratives from the interview transcripts into themes and was an iterative process. Thematic analysis helped to examine different topics within the interview transcripts.

The researcher interpreted the meaning of what he saw and heard based on the context and his prior understanding. The transcribed data from interviews was categorized into main themes by searching for similarities as part of the qualitative data analysis (APPENDIX: G). This allowed the researcher to arrange and analyze the data systematically and rigorously using a Microsoft Excel spreadsheet and a manual process (Saunders et al., 2003). In addition the research interpretation showed how multiple views of the problem emerged (Creswell, 2009). Cases were analyzed to find important themes and other salient features. The qualitative data analysis involved arranging data into categories (open coding), positioning and categorizing within theoretical models (axial coding) and narrating a story from interconnected categories (selective coding).

The qualitative data analysis was therefore iterative in nature involving a back and forth process. An iterative approach was used to search, identify and explore codes and themes to produce a thick description of the phenomenon as part of the inductive approach. The themes were also coded and analyzed statistically for easier comparison with the quantitative analysis results. Qualitative researchers have been urged to be more rigorous in their process to avoid criticism from those biased in favour of quantitative research. As part of participant feedback the researcher shared the case study report with some participants to get their feedback. To achieve this, the researcher shows the procedures regarding how the research was conducted using a case study protocol (APPENDIX: E).

#### **4.7.5 Qualitative Data Validation**

Yin (2011) points out the need for transparency in qualitative research through describing and documenting procedures for other researchers to review and understand as part of building trustworthiness and credibility. The research used various strategies to achieve validity such as triangulation, use of participant checking, clarifying researcher bias, rich description and spending a long time in the field. A study is considered valid if the collected and interpreted data produce conclusions that represent and reflect the real world that was studied (Saunders et al., 2003; Yin, 2011). The validity of the research was achieved by validating claims contained in the research.

Yin (2011) maintains that the researcher's positioning of the study does not affect the issues of validity of the research. The researcher documented the research procedures for other researchers to inspect the research finding and conclusions. In addition, the researcher used the case study database to allow independent inspection by other researchers as part of internal validity. The researcher was methodical when conducting the research to allow completeness, cross-checking of the study's procedures and data (Saunders et al., 2003; Yin, 2011). The use of participants' actual language in describing events and the context of the language was important in the research.

The research conclusions were drawn from multiple perspectives to strengthen the research results. The rationale for accepting or rejecting rival explanations was important to improve the study's validity (Oates, 2009; Yin, 2011). Yin (2011) highlights the importance of rival thinking and explanation for strengthening the research study. The use of multiple data sources in the research helped to increase construct validity through convergence of lines of inquiry during data collection (Oates, 2009; Yin, 2009). In addition the availability of a chain of evidence and review of case study reports by key informants increased construct validity of the research. The issue of internal validity was addressed by pattern matching, rival explanation and explanation building.

#### **4.7.6 Generalization**

In qualitative research studies findings are generalized to a theory and not a population in the same way as replication logic in experiments (Myers, 2009; Yin, 2011; Pereira et al., 2013). The major challenge for the research was the external validity. The non-use of samples in case studies makes it difficult to generalize to the population as survey studies do. The case study research is limited to analytical not statistical generalization. The analytical

generalization strives to generalize the findings to the broader theory (theoretical generalization). Yin (2011) adds that qualitative research which is not based on a sample of a population needs an alternative way to generalize the findings which are not based on statistical procedures like surveys.

Oates (2009) concedes that broader conclusions are possible beyond the case itself through analytical generalizations. Myers (2009) suggests that four main types of generalizations are possible from case study research, concepts, theory, implications and rich insight or a combination of these. Analytical generalization has been found suitable for generalizing qualitative research on concepts and theoretical constructs to other similar situations. Having discussed the qualitative data collection phase, the next section discusses the integration of results from quantitative and qualitative phases of the sequential explanatory mixed methods research.

#### **4.8 Integration of Results**

Meta-inferences have been defined as the integration of the quantitative and qualitative research results (Venkatesh et al., 2013). The meta-inferences of quantitative and qualitative analysis offered insightful rich findings as the data were compared before being merged into meta-inferences (APPENDIX: I). The triangulation of different results from qualitative and quantitative phases offered rich insight into the phenomenon of IT adoption decision making in organisations. Results from the qualitative phase were compared with qualitative phase results as parts of method triangulation. The integrative framework helped to achieve design adequacy of quantitative data (for example, validity and reliability) and qualitative data (credibility) (Swanson & Holton, 2005; Venkatesh et al., 2013).

Meta-inferences of mixed methods research were based on the integration of findings from both qualitative and quantitative strands (Miller, 2003; Venkatesh et al., 2013). From a meta-inference point of view mixed methods research provides opportunity for triangulating findings from different research approaches. The meta-inferences which are inductive in nature are part of a mixed methods research inquiry that is neither inductive nor deductive (Venkatesh et al., 2013). Venkatesh et al., (2013) urge researchers developing meta-inferences to consider separating quantitative and qualitative strands in mixed methods research as part of their findings.

The bridging process of meta-inferences helps to get consensus between quantitative and qualitative findings. Bridging was important in this sequential explanatory mixed methods

research as it helps to develop and expand the view of the phenomenon of interest. The qualitative research helps to develop plausible theoretical integrative understanding whilst the quantitative inductive process incorporates different development theories. The meta-inferences helped to develop in-depth theoretical understanding and findings which a single method cannot offer (a substantive theory of a phenomenon of interest). The quantitative and qualitative phase findings are mixed to provide a better understanding of the mixed methods research study. The qualitative interview phase provided a better understanding of the quantitative results. The participants for the qualitative phase were selected from those who met specific criteria based on quantitative results. The quantitative results used to select participants for the second qualitative phase included descriptive statistics, including significant differences between groups.

Venkatesh et al. (2013) say that “the integrative framework enhances rigor in the integration of the findings and inferences of the mixed methods research through integrative efficacy (inferences are effectively integrated into theoretically consistent meta-inferences), integrative correspondence (meta-inferences satisfy the initial purpose of doing a mixed methods research study) and inference transferability (meta-inferences are generalizable to other contexts and settings)”. The integrative efficacy does not necessarily mean that there is consensus of results from qualitative and quantitative research findings.

The purpose of conducting a mixed methods research was to help achieve completeness as results from quantitative research informed the qualitative studies. The mixed methods research helped in confirmation and expansion as the additional insights from quantitative and qualitative gave additional insight into the phenomenon of interest (Creswell, 2010; Teddlie et al., 2009). The rationale for using mixed methods research is that quantitative and qualitative phases offset each other’s disadvantages if the mix has complementary strengths and non-overlapping weaknesses (Johnson & Turner 2003; Teddlie et al., 2009). The mixing of qualitative (in depth interviews) and quantitative (questionnaires) data yields complete results to make better inferences about IT adoption decision making in organisations (Brewer & Hunter, 2006; Teddlie et al., 2009). Teddlie et al. (2009) note that diversity of opinion in mixed methods is welcome as it reflects different voices and perspectives on IT adoption decision making in organisations.

#### **4.8.1 Validating Mixed Methods Research**

Venkatesh et al. (2013) developed an integrated framework for assisting IS researcher to



validate mixed methods research (APPENDIX: I). The integrative framework provides guidelines for conducting high quality mixed methods research and drawing inferences from quantitative and qualitative strands to generate meta-inferences. The integration of qualitative and quantitative studies is done by comparing, contrasting, infusing, linking and blending findings from the two approaches. The integrative framework provides a holistic insight into the phenomenon of interest by validating quantitative and qualitative studies independently before mixed methods meta-inferences (integrative inferences).

The use of a mixed methods research strategy enhances validity through triangulation and from more in-depth description of the phenomenon (Venkatesh et al., 2013). The advantages of mixed methods research in producing new knowledge and contributions are therefore undeniable. The biggest challenge of mixed methods research is that it requires more skills and resources to achieve its benefits. The research quality and rigour were enhanced by both qualitative and quantitative validation. The quantitative validation process and principles have matured enough compared to qualitative validation which has no general consensus to processes and principles (Venkatesh et al., 2013). The quantitative and qualitative validations were conducted separately before the mixed methods validation. Mixed methods research validation involved assessing the quality of inferences from qualitative and quantitative research inquiry. The integrated findings (meta-inferences) involve the establishment of validity of quantitative and qualitative strands of mixed methods (Maxwell, 2004).

The data analysis of this research was based on the rigorous standards of both the qualitative and quantitative research. The mixed methods data analysis for quantitative and qualitative results was important for credible inferences of the analysis. The analysis process of the quantitative and qualitative data was based on research questions and objectives. The quality of the qualitative and quantitative data was very important in developing high quality meta-inferences. The validity of qualitative and quantitative strands was discussed independently before the meta-inferences validation discussion as part of the design, analysis and findings. The qualitative validation included design validity, measurement validity and inferential validity. The discussion of qualitative validation helped bridge the gap between qualitative and quantitative worldviews by creating a shared common language of research. This assisted discussion of the mixed methods part of the research (see APPENDIX: I).

Reliability and validity of measures of the quantitative phase are the primary validation issues as they are part of summative and formative validity (Tashakkori & Teddlie, 2003; Lee &

Hubona 2009). Reliability of measurement is a precondition of quantitative research validity. Validity enhanced the legitimacy of the research findings based on measurement, design and inferential quantitative research (Shadish et al., 2002; Maxwell, 2004; Teddlie et al., 2009). The three types of validity helped to enhance content and construct validity, internal and external validity and statistical conclusion validity.

Unlike quantitative research, qualitative research lacks agreed acceptable validation guidelines. The quantitative validation based on reliability has been found unsuitable for qualitative research (Guba & Lincoln, 2005; Tashakkori & Teddlie, 2003). However there is consensus among researchers that validation is important in qualitative research (Lee & Hubona, 2009; Teddlie et al., 2009). Some researchers prefer using the term dependability and consistency as similar to reliability in qualitative research (Lincoln and Guba, 1985; Teddlie et al., 2009). Descriptive, interpretive and theoretical validity has been found suitable and sufficient to establish reliability in qualitative research. Descriptive validation is similar to design validity, theoretical validity is similar to analytical validity and interpretive validity is similar to inferential validity in the quantitative research method (Maxwell, 2004; Guba & Lincoln, 2005; Teddlie et al., 2009).

Ridenour and Newman (2008) mention the importance of rigour in the design validity (how well a quantitative study was designed and executed), analytical (how well a qualitative data were collected and analyzed) and inferential validity (the quality of the interpretation). Some researchers suggested that rigor in qualitative research is the application of methods, interpretation of data, data collection and analysis as adequate (Guba and Lincoln, 2005; Ridenour and Newman, 2008). Some researchers prefer rigorous treatment of validity in both quantitative and qualitative research (Tashakkori & Teddlie, 2003; Maxwell, 2004; Lee & Hubona, 2009). Having discussed integrating the results, the next section discusses the ethical consideration of the study.

#### **4.9 Ethical Consideration**

Permission to access the organisations was requested through gatekeepers. The participants were assured of confidentiality as transcripts, notes and audiotapes were stored in a lockable place and names of the participants were disguised. Participants signed consent forms before the start of the interview. Ethical clearance was obtained from University of South Africa before the data collection process. Having discussed the ethical considerations of the study, the next section discusses the scope and limitation of the study.

#### **4.10 Scope and Limitations**

This research focused on two organisations that volunteered to participate in the study. The results of the study may therefore not be generalizable to other organisations in South Africa since they are based on two case studies. Given that the study is based on two organisations, the results from the research are more likely to be transferable only to other organisations in similar contexts. Although the research has limitations, it provides an opportunity for further research in IT adoption governance in organisations. The diversity of the participants from the organisations added to the richness of the data. Case studies have been criticized for the difficulty to generalize the research results. Oates (2009) highlights the hardships found in trying to generalize the case study research findings in similar contexts. Having discussed the limitations of the research, the next section discusses the implications of the research.

#### **4.11 Implications of Research**

Academics have been criticized for focusing on rigour at the expense of the relevance when doing business research (Oates, 2009; Myers, 2009). Most rigorous research has been criticized for not being suitable to deal with unquantifiable complex issues faced by modern business. Traditional scientific methods based on statistical analysis are ill-equipped to deal with complex business decisions based on incomplete data (Myers, 2009; Teddlie et al., 2009). The value of the research was its ability to deal with the reality of the business world which is complex and unquantifiable in nature (Yin, 2009; Myers, 2009). The research allowed the researcher to engage with participants, which afforded the research to achieve both relevance and rigour in business research. The complex unquantifiable business challenges were understood in an in-depth manner.

IT researchers have been urged not only to apply a rigorous methodology best suited to their research objectives, but to produce consumable research for practitioners. This research answers this call. IT managers need prescriptions on IT adoption decision making for effective interventions to achieve successful adoption. The research results will help IT adoption decision making in organisations. The research contributed to the existing body of knowledge on IT adoption in organisations. The next section gives a concluding summary of the research methodology chapter.

#### **4.12 Conclusion**

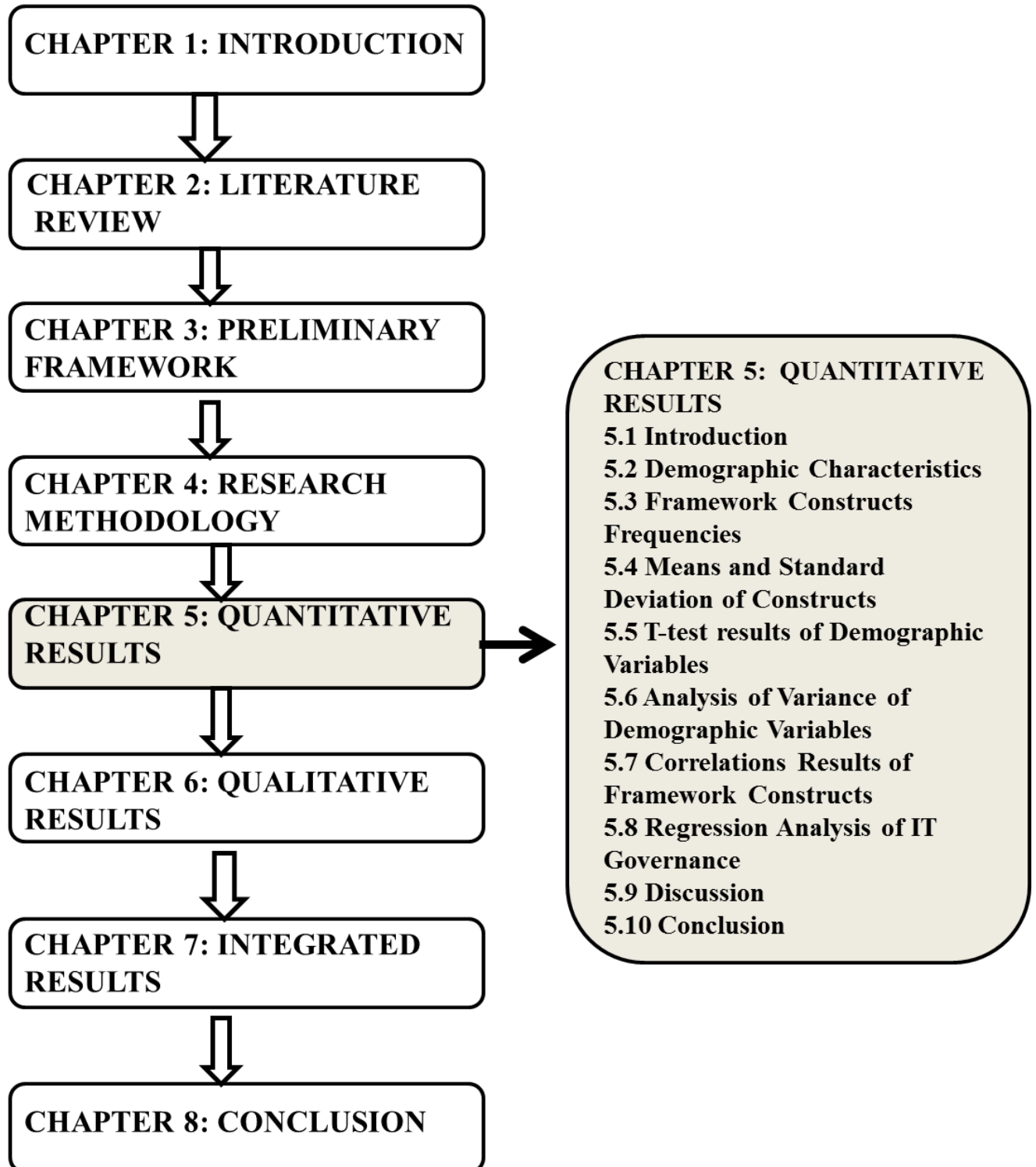
This chapter discussed the research methodology used to validate the preliminary IT adoption governance framework to assist organisations with IT adoption decision making. This chapter also highlighted the rationale for using sequential explanatory mixed methods research to

validate the preliminary IT adoption governance framework in terms of its suitability to answer the research questions. This chapter provided the rationale for the selection of the research methodology as part of answering the research question. The research philosophy helped to provide the foundation of the study. In addition, the research philosophy helped to position and articulates the fitness of the design of the study and provided the paradigm that helped to develop the research.

The research paradigm was important in defining the philosophical assumptions and their suitability to the study. The research strategy helped to justify why the case study research strategy was suitable for the study. The research strategy assisted in highlighting the suitability of a case study research strategy in handling the pragmatic approach which allows researchers to bridge paradigms through mixed methods and multiple data sources. In addition, the research strategy addressed the issues regarding the number of case studies and the selection of case studies.

The research approach was important to articulate why sequential explanatory mixed methods research was found suitable for the research problem which could not be handled by a single method approach. The research methods helped to clarify the sample size of the quantitative and qualitative phases of the sequential explanatory mixed methods research. The research method was also important to highlight the purpose of mixed methods research in information systems. In addition, the chapter looked at other contentious issues such as validity, credibility and reliability of case study research. Ethical considerations and limitations of the research were also discussed. The next chapter presents and discusses the results of the quantitative phase for validating the preliminary IT adoption governance framework.

## Chapter 5: Diagrammatic Overview



## **CHAPTER 5: QUANTITATIVE RESULTS**

### **5.1 Introduction**

The previous chapter discussed the research methodology used to validate the preliminary IT adoption governance framework to assist organisations with IT adoption decision making. The previous chapter also highlighted the rationale for using mixed methods research to validate the IT adoption governance framework in terms of its suitability to answer the research questions. This chapter presents the quantitative results from the questionnaires collected from the two organisations that participated in the study. In addition, the chapter discusses the quantitative results.

The organisations that participated in the study were all using enterprise resource planning (ERP) systems. The selected participants were previously involved in IT adoption in an organisation. The study was, therefore, interested in their perceptions based on previous experience in IT adoption in an organisation. The dependent variable in the study is IT adoption governance. The IT governance measures the respondents' perception on the decision making process during IT adoption in their organisations. The framework constructs were adapted from the literature as part of the proposed framework (see Figure 3.1). The questionnaire was pretested as part of refining some of the unclear questions. The components (constructs) of the framework were tested to see their association and predictive power on the dependent variable IT adoption governance. The suitability of the sample size to the statistical analysis to be conducted was discussed in the previous chapter.

The Likert scale was used to design the questions to measure attitudes in a scientific way. A five point scale was used with lowest: strongly disagree with 1; and highest strongly agree with 5 points. After preliminary analysis, the average of the items (questions) that form the construct were taken to calculate the construct's score to be used for other statistics such as means, standard deviation, t-test, analysis of variance, correlations and regression analysis. This chapter is organized as follows: section 5.2 presents the demographic data, section 5.3 presents the frequencies of the framework constructs, section 5.4 presents means and standard deviations, section 5.5 presents t-test results, section 5.6 presents the analysis of variance results, section 5.7 presents correlation results of the framework constructs, section 5.8

presents the regression analysis results, section 5.9 presents the discussion of the chapter and finally section 5.10 presents conclusion of the chapter.

## 5.2 Demographic Characteristics

The Table 5.1 presents the respondents' demographic characteristics which include: company type, age, gender, departments, position, education, and involvement in IT adoption, number of years in the organisation and member status (see Table 5.1). There were equal numbers of respondents from retail and manufacturing companies.

Table 5.1: Sample Demographics (n=90)

Variable	Categories	Count	%
<b>Comp Type</b>	Manufacturing	45	50
	Retail	45	50
<b>Age</b>	30yrs & below	27	30
	31- 40 years	33	37
	41-50	23	26
	51 and over	7	8
<b>Gender</b>	Male	49	54
	Female	41	46
<b>Department</b>	Finance	22	24
	IT	18	20
	Other	60	66
<b>Position</b>	Other	25	28
	Clerical	8	8
	Managers	24	27
	Supervisors	33	37
<b>Education</b>	Matriculates	38	42
	1st Degree	32	36
	2nd Degree	20	22
<b>Involvement</b>	Involved	38	42
	Not involved	52	58
<b>No of Years</b>	2 years & below	31	34
	3-5 years	23	26
	6-10 years	20	22
	Greater than 10 years	16	18
<b>Co Member</b>	Members	45	50
	Non Members	45	50

In terms of age, Table 5.1 shows that 30 percent of the respondents were 30 years and below, 37 percent were between 31 and 40 years, 26 percent were between 41 and 50 years and finally 8 percent were 51 years and older. The majority of the respondents were males - 54 percent - compared to 46 percent for female respondents. Most of the respondents were from

the Finance department, followed by Information Technology and then other departments.

In terms of positions of respondents, 28 percent were clerical, 27 percent were managers, 9 percent were supervisors and 37 percent were from others, in their organisations. The majority of the respondents had matriculation as their level of education compared to 36 percent of the respondents who had a first degree. The remaining 22 percent of the respondents had a second degree as their level of education. About 42 percent of the respondents were involved in IT adoption in their organisation compared to 58 percent of respondents who were not involved. In terms of number of years in the organisation, 34 percent of the respondents had two years or less, 26 percent had between three and five years, 20 percent had between six and ten years and 17 percent had more than ten years in the organisation. About half of the respondents were members of a committee in their organisation whilst half were not members of any committee in their organisation.

### **5.3 Framework Constructs Frequencies**

The previous section discussed the demographic characteristics of the respondents who participated in the survey. The next sections present the frequency distribution of the IT adoption governance framework constructs. The frequencies are based on the results collected using the questionnaires from the two organisations which participated in the study. Before the frequencies of constructs were analysed, the data was first transformed from a Likert scale of 5 to 3. The values, 1 - Agree, and 2 - Agree Strongly, were merged into 1 - Agree. Disagree and Strongly Disagree, were merged into Strongly Disagree. The neutral response remained the same during the frequency analysis. This resulted in in three value labels, Agree, Neutral and Disagree. This was done to make it easier to present the results in a graphical form as Agree and Strongly Agree all represent positive responses and Disagree and Strongly Disagree represent negative responses. The changes applied to sections 5.3.1 – 5.3.8. The next section presents the Technology Adoption Model (TAM) frequency distribution.

#### **5.3.1 TAM Frequencies**

Figure 5.1 below shows frequencies of respondents on the TAM construct variables. Most of the respondents, 92 percent, agreed that availability of the system was important in IT adoption decision making in organisations compared with a few who disagreed or were neutral. The majority of the respondents agreed that user experience was important in IT



adoption decision making compared with few who disagreed or were neutral. Most of the respondents, 91 percent, agreed that reliability of the system was important in IT adoption decision making in organisations compared with a few who disagreed or were neutral. The majority of the respondents agreed that the security of the system was very important in IT adoption decision making compared with also a few who disagreed or were neutral. Ninety percent of the respondents agreed that usefulness of the system was important in IT adoption decision making compared with few who disagreed or were neutral.

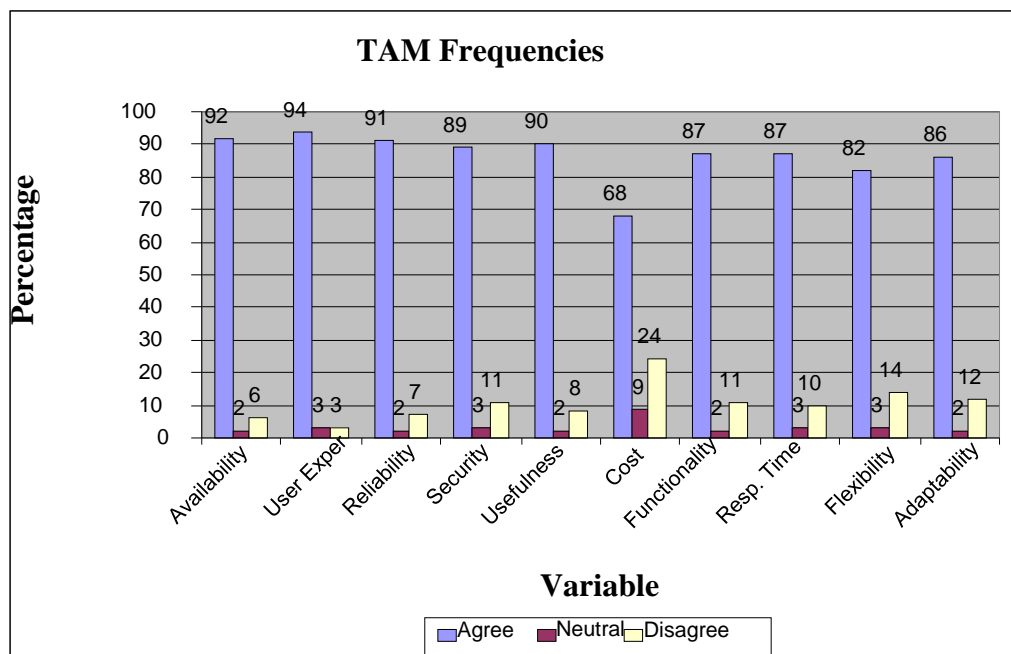


Figure 5.1: Technology Adoption Model (TAM) Frequencies

The majority of the respondents agreed that the cost of the system was very important in IT adoption decision making compared with few who disagreed or were neutral. Most respondents, 87 percent, agreed that system functionality was important in IT adoption decision making in organisations compared with a few who disagreed or were neutral. The majority of the respondents agreed that the system responses time was important in IT adoption decision making compared with a few who disagreed or were neutral. Most of the respondents, 82 percent, agreed that system flexibility was important in IT adoption decision making compared with a few who disagreed or were neutral. The majority of the respondents agreed that system adaptability was important in IT adoption decision making compared with a few who disagreed or were neutral. The results suggest that respondents agreed on TAM construct variables with all having above fifty percent on agreed. The results suggest show

that user experience was the most important variable among the participants in the two organisations.

### 5.3.2 IT Governance Frequencies

Figure 5.2 above shows frequencies of respondents on the IT governance construct variables. Only a third of the respondents agreed that IT adoption decision making was always transparent compared to those who disagreed or were neutral. Also about a third of the respondents agreed that IT and business objectives always aligned compared to those who disagreed or were neutral. About less than a quarter of the respondents agreed that objectives were always clear to stakeholders compared to those who disagreed or were neutral. Slightly less than a third of the respondents agreed that there was shared responsibility in IT adoption compared to those who disagreed or were neutral. Slightly above a quarter of the respondents agreed that the desired outcomes were always clear compared to those who disagreed or were neutral. Slightly above a quarter of the respondents agreed that benefits were always clear compared to those who disagreed or were neutral. A majority of the respondents, 44 percent, agreed that objectives were always clear compared to those who disagreed or were neutral. Slightly above a quarter of the respondents agreed that the desired outcomes were always clear compared to those who disagreed or were neutral.

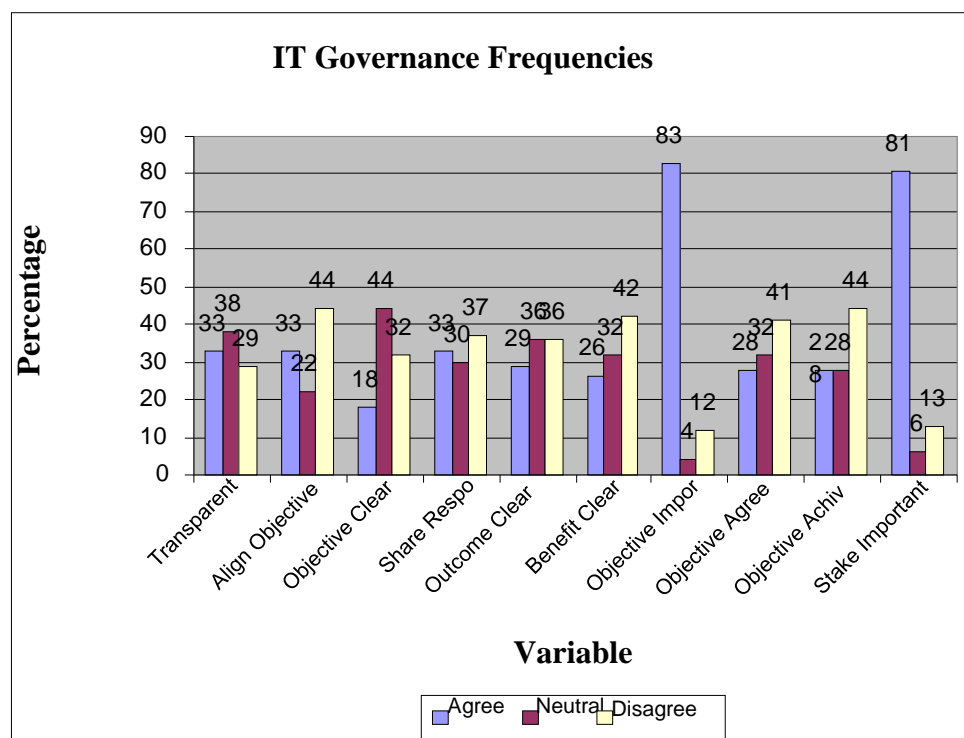


Figure 5.2: IT Governance Frequencies

Slightly above a quarter of the respondents agreed that benefits were always clear compared to those who disagreed or were neutral. A majority of the respondents, 44 percent, agreed that

clear IT objectives were important compared with a few who disagreed or were neutral. Slightly above a quarter of the respondents agreed that there was always agreement on IT adoption objectives compared to those who disagreed or were neutral. Slightly above a quarter of the respondents agreed that IT adoption objectives were always achieved compared to those who disagreed or were neutral. A majority of the respondents, 81 percent, agreed that stakeholder participation was important compared to those who disagreed or were neutral. The results show only two of IT governance constructs variables that had more than fifty percent in agreement. The respondents agreed that IT objectives and stakeholder involvement were important during IT adoption in organisations. The few who agreed suggested that respondents were not pleased with IT governance in their organisations. The results suggest the need for improvement in IT governance in the organisations.

### **5.3.3 Stakeholder Participation Frequencies**

Figure 5.3 shows frequencies of responses on stakeholder participation construct variables. Most of the respondents, 83 percent, agreed that consulting stakeholders during IT adoption in organisation was important compared to those who disagreed or were neutral. Slightly above half of the respondents agreed that IT adoption decisions should be based on stakeholders, perspectives compared to those who disagreed or were neutral. Slightly less than half of the respondents agreed that stakeholder perspectives were important in IT adoption decision making compared to those who disagreed or were neutral. Slightly less than a quarter of the respondents agreed that there was always stakeholders' agreement on IT adoption benefits compared to those who disagreed or were neutral. A majority of the respondents, 79 percent, agreed that stakeholder participation could contribute to IT adoption success in organisations compared to those who disagreed or were neutral.

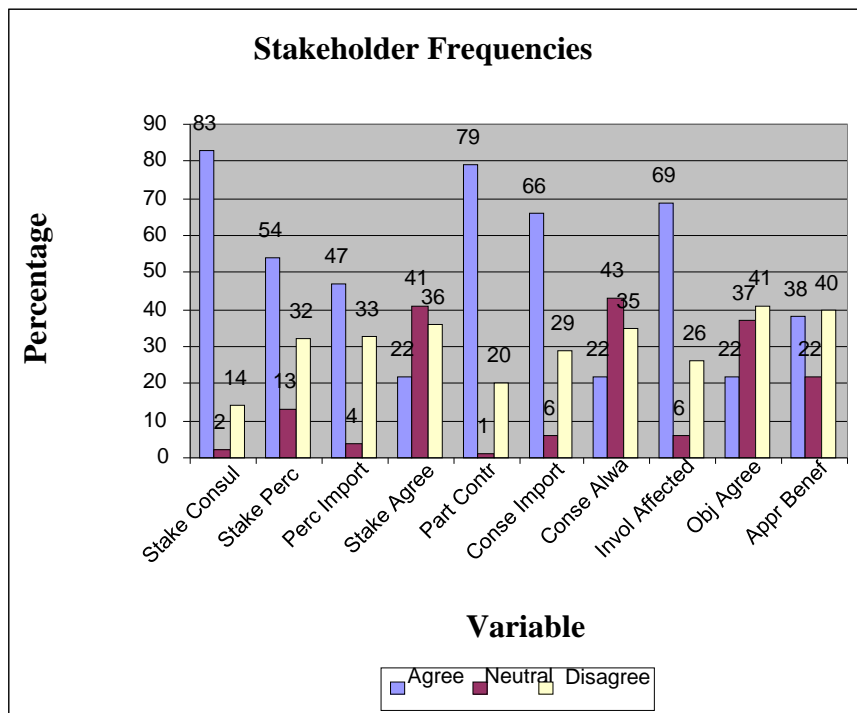


Figure 5.3: Stakeholder Participation Frequencies

Most of the respondents, 66 percent, agreed that consensus was important in IT adoption in an organisation compared to those who disagreed or were neutral. Less than a quarter of the respondents agreed that there was always consensus on IT adoption objectives in organisation compared to those who disagreed or were neutral. Most of the respondents, 69 percent, agreed that the affected stakeholders should be involved in IT adoption decision making compared to those who disagreed or were neutral. Less than a quarter of the respondents agreed that IT and stakeholders objectives always agreed compared to those who disagreed or were neutral. Slightly above a third of the respondents agreed that stakeholder's appreciated IT adoption benefits compared to those who disagreed or were neutral. The results show that most respondents agreed on six of the stakeholder construct variables, which had more than fifty percent agreement. Overall most respondents agreed that stakeholders needed to participate in IT adoption decision making.

#### 5.3.4 Sociological Paradigms Frequencies

Figure 5.4 below shows frequencies of respondents on the sociological construct variables after sub-components were combined to make one construct. Most of the respondents, 59 percent, agreed that social issues were important to IT adoption in organisations compared to

those who disagreed or were neutral. A majority of the respondents, 67 percent, agreed that addressing social issues was important for IT adoption success compared to those who disagreed or were neutral. Most of the respondents, 77 percent, agreed that social issues might impact IT adoption success compared to those who disagreed or were neutral. A majority of the respondents, 85 percent, agreed that it was important for stakeholders to discuss IT adoption issues compared to those who disagreed or were neutral. Most of the respondents, 58 percent, agreed that social issues needed debate compared to those who disagreed or were neutral. A majority of the respondents, 68 percent, agreed that stakeholders needed IT knowledge to participate in IT adoption compared to those who disagreed or were neutral. Most of the respondents, 79 percent, agreed that social issues needed debate compared to those who disagreed or were neutral. A majority of the respondents, 68 percent, agreed that stakeholders needed IT knowledge to participate in IT adoption compared to those who disagreed or were neutral.

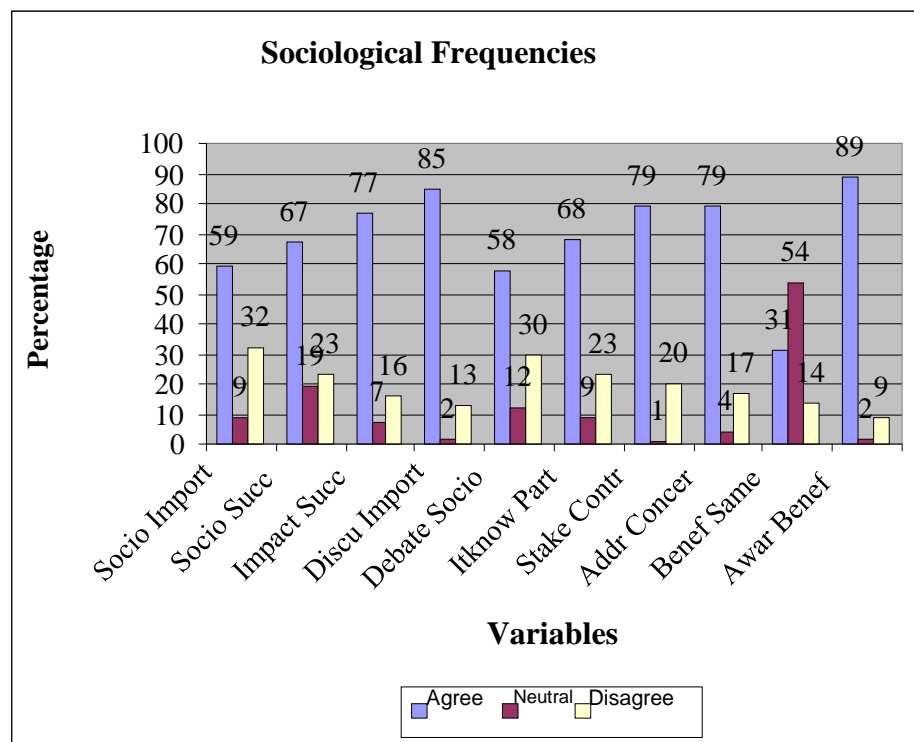


Figure 5.4: Sociological Paradigms Frequencies

Most of the respondents, 79 percent, agreed that stakeholders could contribute in IT adoption decision making in organisations compared to those who disagreed or were neutral. A majority of the respondents, 79 percent, agreed that it was important to address stakeholders' concerns before IT adoption compared to those who disagreed or were neutral. Slightly less than a third of the respondents agreed that IT benefits were the same for all stakeholders in

organisations compared to those who disagreed or were neutral. Most of the respondents, 89 percent, agreed that stakeholders needed awareness on IT adoption benefits compared to those who disagreed or were neutral. A majority of respondents agreed on most of the sociological paradigm constructs variables except on that stakeholders' view IT adoption in the same way. The high disagreement on stakeholders having the same views on IT adoption is important as it confirms the literature that stakeholders always have different worldviews with regard to IT adoption benefits in organisations. This makes it important for stakeholders to discuss the expected benefits of IT adoption from the organisation's perspective.

### **5.3.5 Hard Systems Thinking Frequencies**

Figure 5.5 below shows frequencies of responses on the hard systems thinking construct variables. Slightly more than half of the respondents agreed that there was always agreement on IT adoption objectives compared to those who disagreed or were neutral. Most of the respondents, 67 percent, agreed that IT adoption success could be measured compared to those who disagreed or were neutral. Slightly more than a third of the respondents agreed that IT adoption success could be guaranteed compared to those who disagreed or were neutral. Most of the respondents, 79 percent, agreed that the measure of IT adoption success was always clear compared to those who disagreed or were neutral. Slightly less than half of the respondents agreed that IT adoption outcomes were predictable compared to those who disagreed or were neutral. Almost half of the respondents agreed that IT benefits could be predictable compared to those who disagreed or were neutral. Slightly more than a third of the respondents disagreed that unity of purpose always exists in IT adoption compared to those who disagreed or were neutral.

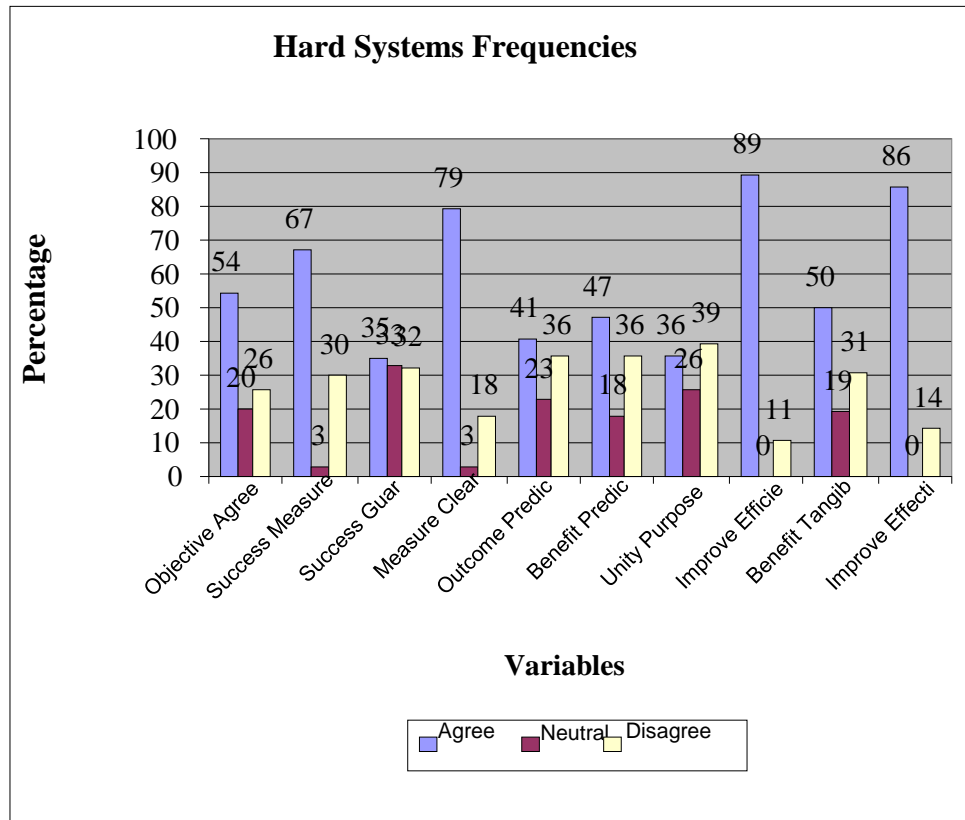


Figure 5.5: Hard Systems Thinking Frequencies

A majority of the respondents, 89 percent, agreed that IT adoption improved efficiency in organisations compared to those who disagreed or were neutral. Half of the respondents agreed that IT adoption benefits were always tangible compared to those who disagreed or were neutral. Most of the respondents, 86 percent, agreed that IT adoption could improve effectiveness in organisations compared to those who disagreed or were neutral. A majority of respondents agreed on six hard systems constructs variables with fifty percent agreeing on effectiveness, efficiency, tangible outcomes, success measured and success clear on IT adoption in organisations. The other variables of the construct had less than fifty percent agreement. However most of the respondents concurred that there was not ways agreement on IT adoption objectives which justifies the need for a soft systems component to address the issue of consensus during IT adoption in organisations. The results support the literature that although the hard systems thinking component's assumption is the existence of agreement on objectives, that is not the case in the real world of organisations.

### 5.3.6 Soft Systems Thinking Frequencies

Figure 5.6 below shows frequencies of respondents on the soft systems thinking construct variables. Most of the respondents, 79 percent, agreed that consensus in IT adoption objectives was important compared to those who disagreed or were neutral. A majority of the respondents, 74 percent, agreed that stakeholders should debate IT adoption objectives compared to those who disagreed or were neutral. Most of the respondents, 78 percent, agreed that stakeholders should be involved in IT adoption decision making compared to those who disagreed or were neutral. A majority of the respondents, 76 percent, agreed that stakeholders' perceptions should be accommodated in IT adoption compared to those who disagreed or were neutral. Most of the respondents, 74 percent, agreed that stakeholder views were important to IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 61 percent, agreed that soft issues were important in IT adoption compared to those who disagreed or were neutral. About half of the respondents agreed that political issues were important in IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 70 percent, agreed that change attitude was important in IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 69 percent, agreed that incorporate views was important in IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 62 percent, agreed that stakeholder agree was important in IT adoption compared to those who disagreed or were neutral.

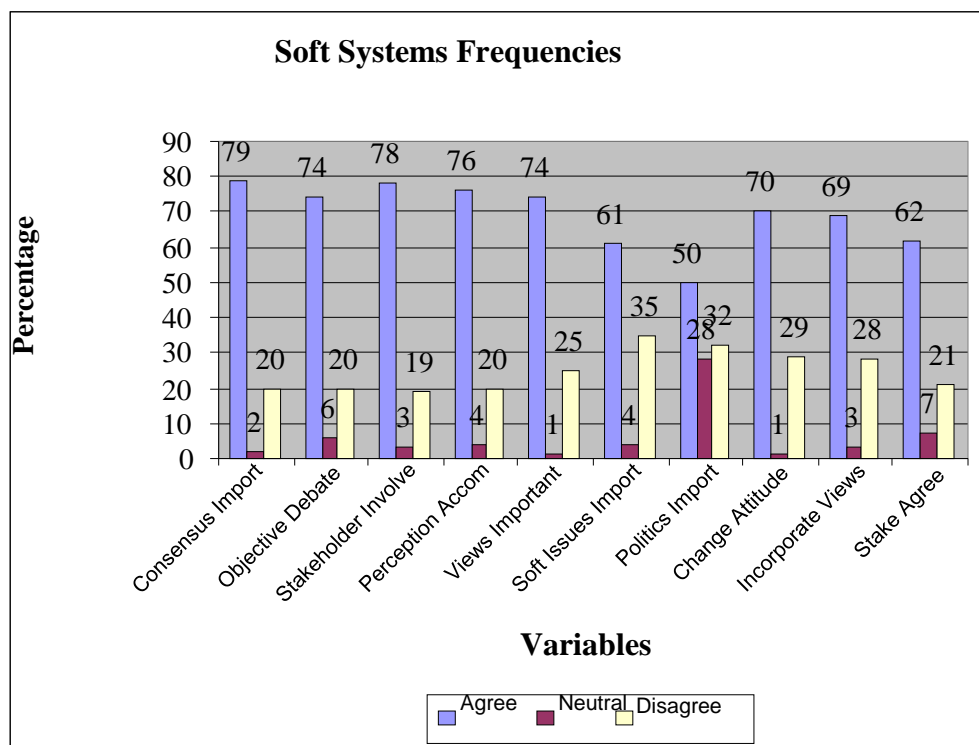


Figure 5.6: Soft Systems Thinking Frequencies



Most of the respondents, 70 percent, agreed that stakeholder attitude towards IT adoption could be changed compared to those who disagreed or were neutral. A majority of the respondents agreed that stakeholder worldviews must be incorporated in IT decision making compared to those who disagreed or were neutral. Most of the respondents, 62 percent, agreed that it was important to seek stakeholder agreement in IT objectives compared to those who disagreed or were neutral. A majority of respondents agreed on all soft systems constructs variables with all variables having more than fifty percent agreement. Of particular importance is that most respondents agreed that stakeholder attitude towards IT adoption could be changed. This is important in that changing stakeholder attitudes from negative to positive enhances IT adoption in organisation as they will have buy-in to the process. IT is therefore important to know which variables or constructs are important in changing stakeholders' attitudes from negative to positive for IT adoption to be successful.

### **5.3.7 Emancipatory Systems Thinking Frequencies**

Figure 5.7 below presents the frequency of responses on the emancipatory systems thinking construct variables. About a quarter of the respondents agreed that there was always fairness in IT adoption decision making compared to those who disagreed or were neutral. A majority of the respondents, 62 percent, agreed that there was always conflict during IT adoption compared to those who disagreed or were neutral. Most of the respondents, 76 percent, agreed that power relations could affect IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 60 percent, agreed that inequalities might affect IT adoption compared to those who disagreed or were neutral. Most of the respondents, 59 percent, agreed that coercion might affect IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 86 percent, agreed that the nature of IT adoption improvement was important compared to those who disagreed or were neutral. Most of the respondents, 73 percent, agreed that affected stakeholders were important in IT adoption compared to those who disagreed or were neutral.

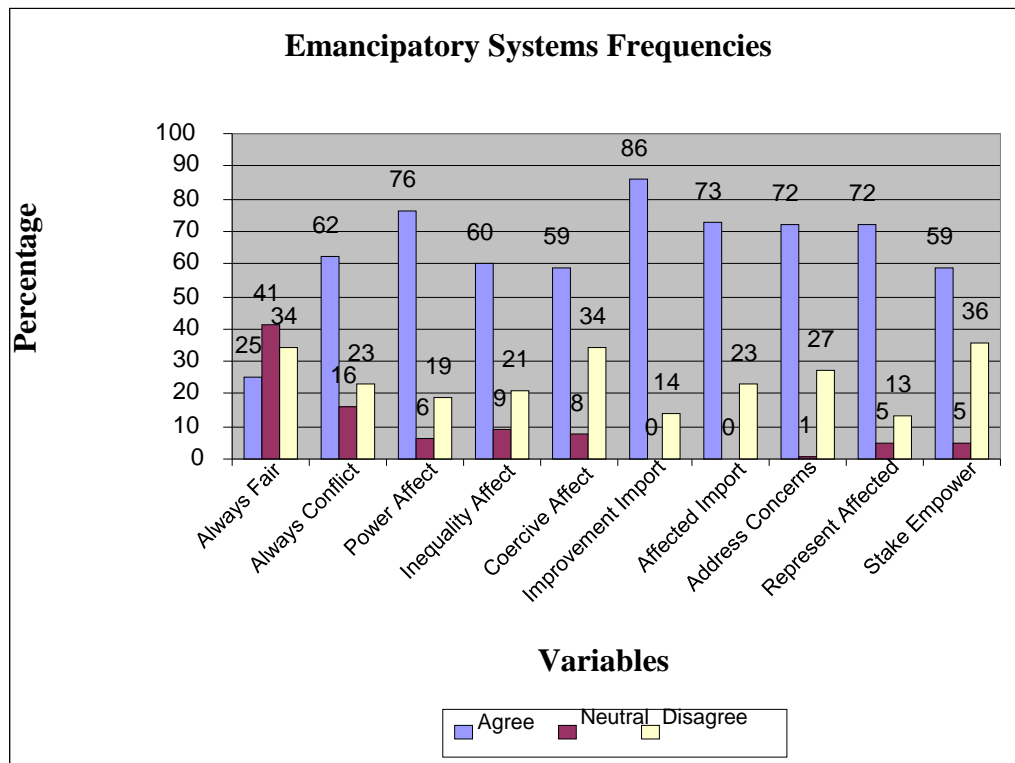


Figure 5.7: Emancipatory Systems Thinking Frequencies

A majority of the respondents, 72 percent, agreed that affected stakeholders concerns need to be addressed before IT adoption compared to those who disagreed or were neutral. Most of the respondents, 72 percent, agreed that representation of affected stakeholders was important compared to those who disagreed or were neutral. More than half of the respondents agreed stakeholder empowerment was important in IT adoption compared to those who disagreed or were neutral. A majority of the respondents agreed on most of the emancipatory systems thinking construct variables; which had more than fifty percent in agreement except one variable, existence of fairness during IT adoption in organisations. The results suggest that respondents agreed that conflict; power relations, inequalities and coercion affected IT adoption in organisations. In addition, respondents agreed that stakeholders must be empowered, involved and represented during IT adoption decision making in organisations. Many respondents disagreed that there was always fairness during IT adoption in organisations which justifies the need of emancipatory systems thinking component to the framework

### 5.3.8 Critical Systems Thinking Frequencies

Figure 5.8 below presents the frequency of the critical systems thinking construct variables. A majority of the respondents, 62 percent, agreed that stakeholder diversity of perception was important in IT adoption compared to those who disagreed or were neutral. Slightly more than half of the respondents agreed that it was important to address issues of oppression during IT adoption compared to those who disagreed or were neutral. Slightly less than a third of the respondents agreed that it was important to address political issues during IT adoption compared to those who disagreed or were neutral. More than half of the respondents agreed that it was important to address social issues during IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 85 percent, agreed that it was important to address critical issues during IT adoption compared to those who disagreed or were neutral. Most of the respondents, 70 percent, agreed that it was important to address ethical issues during IT adoption compared to those who disagreed or were neutral. More than half of the respondents agreed that it was important to address critical issues during IT adoption compared to those who disagreed or were neutral. Most of the respondents, 70 percent, agreed that it was important to address ethical issues during IT adoption compared to those who disagreed or were neutral. More than half of the respondents agreed that it was important to address critical issues during IT adoption compared to those who disagreed or were neutral. Most of the respondents, 70 percent, agreed that it was important to address ethical issues during IT adoption compared to those who disagreed or were neutral.

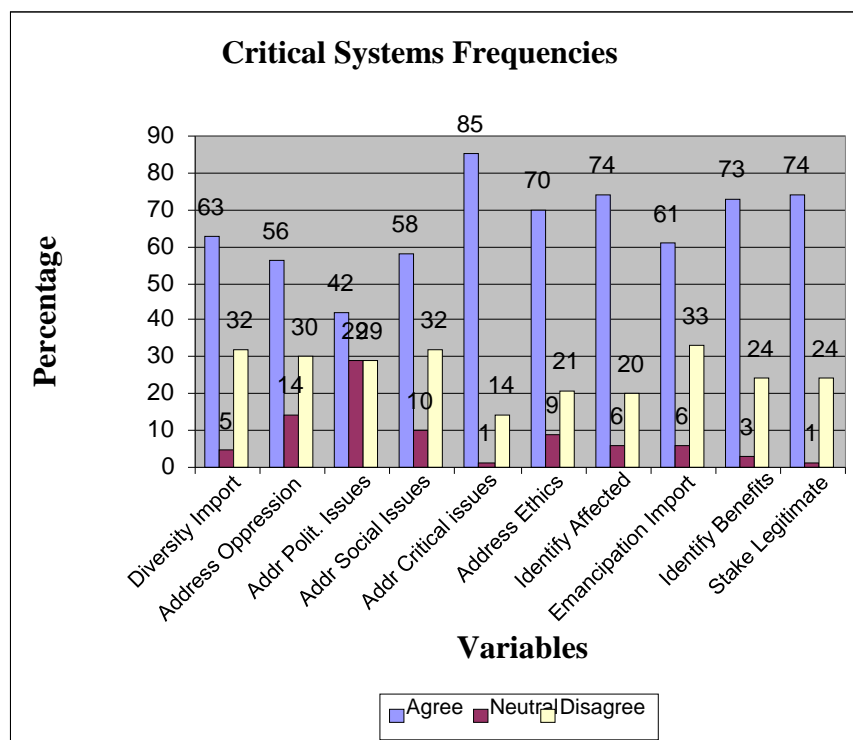


Figure 5.8: Critical Systems Thinking Frequencies

Nearly three quarters of the respondents agreed that it was important to identify affected stakeholders during IT adoption compared to those who disagreed or were neutral. More than

half of the respondents agreed that it was important to emancipate stakeholders during IT adoption compared to those who disagreed or were neutral. Most of the respondents, 73 percent, agreed that it was important to identify beneficiary stakeholders during IT adoption compared to those who disagreed or were neutral. A majority of the respondents, 74 percent, agreed that it was important for IT adoption to be legitimate for all stakeholders compared to those who disagreed or were neutral. A majority of the respondents agreed on most of the critical systems construct variables with more the fifty percent in agreement. In general, a majority of respondents supported stakeholder perception diversity, addressing political, ethical, oppression and social issues during IT adoption in organisations. They also agreed that affected stakeholders needed to be identified, emancipated and IT adoption to be legitimate.

The results suggest that the critical systems component is an important component of the proposed IT adoption governance framework as it addresses issues of diversity of perceptions not possible with other components of the framework. In summary, the results indicate that most of the respondents agreed on most of the constructs variables of the proposed IT governance framework. The IT governance had the least number of variables were the respondents agreed. The results suggest that most of the respondents do not agree with issues of IT governance in the organisations. The low percentage recorded regarding agreement on the IT Governance constructs calls for further investigation as part of the validation of the proposed IT governance framework. The next section presents the means and standard deviation of the constructs after testing for reliability.

#### **5.4 Means and Standard Deviation of Constructs**

A reliability test was conducted on all constructs using Cronbach alpha. Results were interpreted as good with all constructs being above 0.8 which was above the minimum acceptable of 0.6. Before means, standard deviation, T-test, analysis of variance, correlation and regression were performed the constructs were scored after removing unreliable items (refer Table 4.4). The scoring was important to perform inferential statistics on constructs of the IT adoption governance framework. Descriptive statistics were conducted which produced the results in Figure 5.9 below.

The group means and standard deviation results show that most respondents were neutral on IT governance construct variables as indicated previously by the frequency results. The IT governance construct had the lowest mean and highest standard deviation of all the constructs

of the IT adoption governance framework. The lowest mean suggests that it had the least agreement of the constructs among respondents and the highest standard deviation suggests the respondents varied much in their responses.

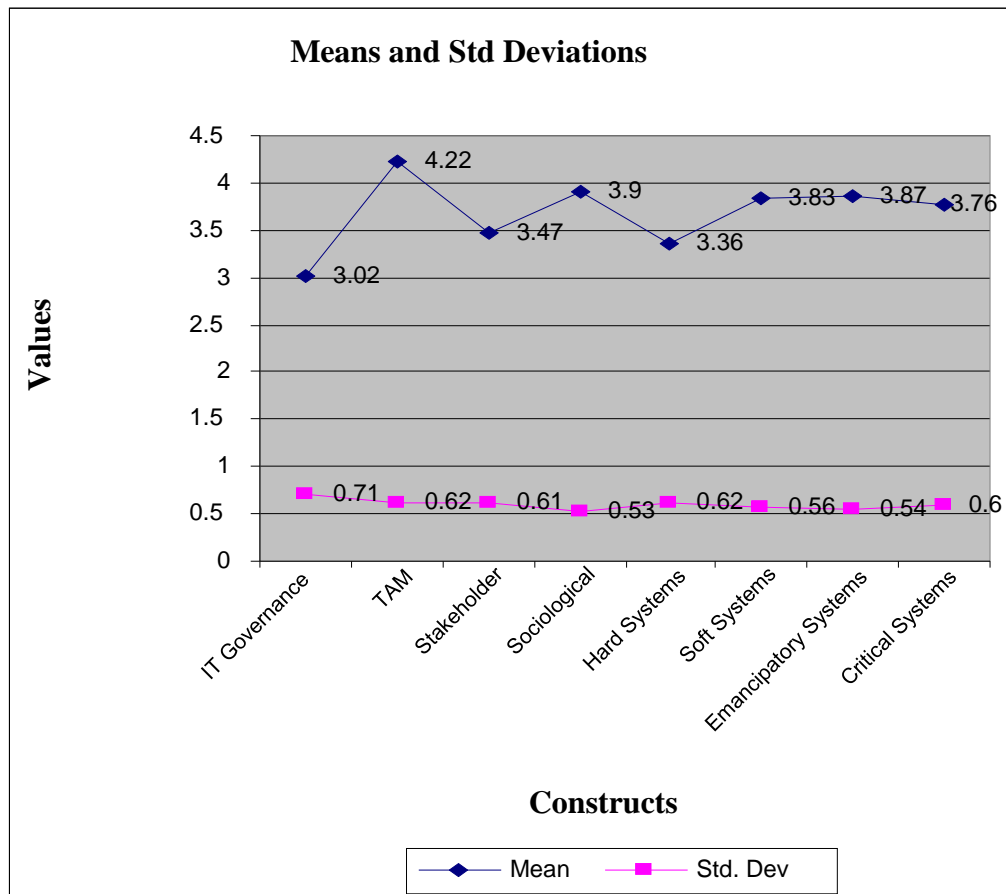


Figure 5.9: Mean and Standard Deviation of Constructs

Respondents agreed mostly on the TAM construct which had the highest mean of all constructs of the proposed framework. This results support literature that TAM is still the most popular model for individual technology adoption although it may not be useful from an organisation's perspective (see section 2.2). The sociological paradigm construct had the lowest standard deviation of the constructs which suggests the respondents' answers did not differ much on the construct. In summary the results suggest that the organisations have challenges with IT governance issues. The next section presents the t-test results for assessing significant difference between demographic variables and the constructs scores of the

proposed with two categories.

### 5.5 T-Test results of demographic variables

The t-test was useful to assess significant differences between the mean constructs of demographic variables with two categories such as company, sex and so forth. The significance differences of the constructs were important in order to know whether the two organisations' respondents had different perceptions about IT adoption governance framework constructs. In addition, the test results would indicate if demographic variables had an effect on the IT adoption governance framework constructs. The results of the T-test analysis helped to select participants for the next qualitative phase.

The t-test conducted showed significant differences on IT governance ( $p=.038$ ) between the two companies' retail and manufacturing respondents in terms of perceptions. The results suggest that there are significant differences between the respondents from the two companies with regards to their perception on IT governance in their organisations. The results show that manufacturing respondents agreed more on the IT governance construct than did retail respondents (Table 5.2).

Table 5.2 T-test for demographic variables

Independent Variable	Dependent Variable	F value	Significance	Categories
Company	IT Governance Component	2.11	0.038*	Retail and manufacturing
Gender	Soft Systems Thinking Component	2.14	0.035*	Male or Female
Gender	Critical Systems Thinking Component	2.30	0.024*	Male or Female
Involve Status	Critical Systems Thinking Component	2.32	0.023*	Involved and not involved

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ., (n=90)

The gender variable also showed significant differences on soft systems thinking ( $p=.035$ ) and critical systems thinking constructs ( $p=.024$ ) between male and female respondents (Table 5.2). The results suggest that gender has an influence on respondents with respect to perceptions about soft systems thinking and critical systems thinking constructs of the proposed IT adoption governance framework. Male respondents agreed more compared to female respondents on the soft systems thinking and critical systems thinking constructs.

The 'involved status' variable also showed a significant difference on the critical systems

thinking construct ( $p=.023$ ) between the involved and not involved respondents (Table 5.2). The results suggest that the involved variable had a significant influence on respondents' perception on the critical systems thinking construct of the proposed IT adoption governance framework. The results also suggest that the involved participants are likely to agree on the critical systems thinking construct.

## 5.6 Analysis of variance of demographic variables

The analysis of variance (ANOVA) was used to assess significant differences between demographic variables with more than two categories in terms of net effects to the proposed IT governance constructs. In addition multiple post hoc was used to reveal which among the more than two categories differed significantly from one another. The analysis of variance between demographic variables and constructs showed significant differences between departments and constructs' stakeholder participation ( $p < .019$ ) and hard systems thinking ( $p < .001$ ) (Table 5.3). The results suggest that department variable has an influence on respondent attitudes towards stakeholder and hard system thinking constructs of the proposed framework. The results suggest that some departments have a more positive attitude towards stakeholder and hard system thinking constructs than others. The differences between departments are very important to follow up on the qualitative phase to understand why the departments differ in perceptions of the two constructs. The other framework constructs did not differ significantly with the department variable.

Table 5.3 ANOVA for demographic variables

Independent Variable	Dependent Variable	F value	Significance	Categories
Department	Stakeholder Participation Component	2.870	0.019*	6 Departments (Finance, IT, Others)
Department	Hard Systems Thinking Component	4.459	0.001**	6 Departments (Finance, IT, Others)
Education	IT Governance Component	3.782	0.028*	Matriculates, 1 <sup>st</sup> Degree, 2 <sup>nd</sup> Degree
Education	Stakeholder Participation Component	4.569	0.013*	Matriculates, 1 <sup>st</sup> Degree, 2 <sup>nd</sup> Degree
No. of years in Company	Soft Systems Thinking Component	2.751	0.048*	2yrs or less, 3-5 yrs, 6-10 yrs, more than 10 yrs
No. of years in Company	Emancipatory Systems Thinking Component	3.048	0.033*	2yrs or less, 3-5 yrs, 6-10 yrs, more than 10 yrs

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , (n=90)

The analysis of variance was conducted between education and framework constructs and only IT governance ( $p < .028$ ) and stakeholder  $p < .013$  differed significantly among education level (Table 5.3). The results suggest that education level had an influence on perceptions about IT governance and stakeholder constructs. Less educated matriculate respondents were more in agreement with the IT governance construct than first and second degree respondents. The more educated they were the less likely were respondents to agree with the IT governance constructs. The same situation also applied to the stakeholder construct, which was strange in that one would assume that the more educated needed to be more involved. The results therefore need further investigation during the second qualitative interview phase.

The analysis of variance was conducted between number of years in the company and framework constructs and only soft systems thinking ( $p < .048$ ) and emancipatory systems thinking ( $p < .033$ ) differed significantly with number of years in the company (Table 5.3). The results suggest that number of years in the company had an influence on attitudes towards soft systems thinking and emancipatory systems thinking. The more years in the company the more the respondent was likely to agree with soft systems thinking and emancipatory systems thinking. Having discussed the significant differences of the constructs the next section presents the correlation results of the constructs among each other.

## **5.7 Correlation Results of Framework Constructs**

The previous section presented the analysis of variance of demographic variables and the framework constructs. The results showed that only six demographic variables had significant differences with some of the constructs' scores. The demographic variables will be therefore important in purposively selecting participants for the second qualitative interview phase. This section presents results of the correlation of the framework constructs. The correlation was done to determine if there was an association between the constructs.

Correlation analysis statistics were used to assess the association between constructs' scores of the proposed IT adoption governance framework. Correlation analysis helped to determine the degree or strength of the relationship between the constructs of IT adoption governance framework from the participant's perceptions. According to the correlation analysis results shown in Table 5.4, there was a strong positive significant association among the constructs except for the TAM construct. The next sub-sections discuss correlation results of individual



constructs of the framework in relationship with other constructs.

Table 5.4: Correlation Matrix Analyses

Variable	1	2	3	4	5	6	7	8
TAM	1							
IT Governance	-.120	1						
Stakeholder Participation	.121	.560**	1					
Sociological Paradigm	-.039	.203	.433**	1				
Hard Systems Thinking	-.089	.543**	.506**	.378**	1			
Soft Systems Thinking	.025	.141	.445**	.646**	.340**	1		
Emancipatory Sys. Thinking	.048	.183	.428**	.492**	.384**	.696**	1	
Critical Systems Thinking	.032	.196	.419**	.608**	.379**	.648**	.620**	1
* Correlation is significant at the 0.05 level (2-tailed)								
** Correlation is significant at the 0.01 (2-tailed), (n=90)								

### 5.6.1 TAM Construct Correlation Results

The TAM construct has no strong and significant correlation with other constructs of the proposed IT adoption governance framework as shown in Table 5.4. This suggests that TAM had no impact on other constructs of the proposed framework. On that note TAM is not an important component of the proposed framework since it does not have an association with other constructs' scores. Therefore it will not be included in the refined proposed IT adoption governance framework. The results support the literature in that TAM is only suitable at individual technology adoption not at organisation level.

### 5.6.2 IT Governance Construct Correlation Results

The IT governance construct has a strong and significant correlation with stakeholder ( $p < .560$ ) and hard systems thinking ( $p < .543$ ) as shown in Table 5.4. The correlation results suggest that stakeholder and hard system thinking may have an influence on the IT governance construct and are therefore an important part of the proposed framework. The results suggest that the two constructs have a positive relationship with IT governance, which suggests that a change in one construct is followed by changes in the other construct in the same direction. In short, the results suggest that if organisations improve stakeholder participation and hard systems thinking constructs they are likely to get positive attitudes on IT governance from the stakeholders in the organisation. The stakeholder participation and

hard systems thinking components are therefore important parts of the framework as they have an influence on the IT governance framework.

### **5.6.3 Stakeholder Participation Construct Correlation Results**

The stakeholder participation construct has a strong and significant correlation with the sociological paradigm ( $p < .433$ ), hard systems thinking ( $p < .506$ ), soft systems thinking ( $p < .445$ ), emancipatory systems thinking ( $p < .428$ ) and critical systems thinking ( $p < .419$ ) as shown in Table 5.4. The results suggest that changes in the constructs are followed by changes in stakeholder constructs which means that an increase in these constructs is likely to see an increase in the same direction. In short most constructs had strong and significant relationship with stakeholder participation.

### **5.6.4 Sociological Paradigms Construct Correlation Results**

The sociological paradigms construct has a strong and significant correlation with constructs, hard systems thinking ( $p < .378$ ), soft systems thinking ( $p < .646$ ), emancipatory systems thinking ( $p < .492$ ) and critical systems thinking ( $p < .608$ ) as shown in Table 5.4. The results suggest that there is an association between the sociological paradigm and these constructs. The results support the literature on that there is a relationship between sociological paradigms and systems approaches. This suggests that sociological paradigms are aligned to the systems approaches.

### **5.6.5 Hard Systems Thinking Construct Correlation Results**

Hard systems thinking construct has a strong and significant correlation with IT governance ( $p < .543$ ), stakeholder participation ( $p < .506$ ), sociological paradigm ( $p < .378$ ), soft systems thinking ( $p < .340$ ), emancipatory systems thinking ( $p < .384$ ) and critical systems thinking ( $p < .378$ ) as shown in Table 5.4. The results suggest that hard systems thinking correlates with all systems approach sub-components of the proposed framework. The results suggest that hard systems thinking and other systems approach components complement each other's weaknesses.

### **5.6.6 Soft Systems Thinking Construct Correlation Results**

Soft systems thinking construct has a strong and significant correlation with stakeholder participation ( $p < .445$ ), sociological paradigm ( $p < .646$ ), hard systems thinking ( $p < .340$ ), emancipatory systems thinking ( $p < .696$ ), and critical systems thinking ( $p < .648$ ) as shown

in Table 5.4. The results suggest that hard systems thinking correlates with all systems approach sub-components of the proposed framework. The results suggest that hard systems thinking and other systems approach components complement each other's weaknesses.

#### **5.6.7 Emancipatory Systems Thinking Construct Correlation Results**

The emancipatory systems thinking construct has a strong and significant correlation with stakeholder participation ( $p < .428$ ), sociological paradigm ( $p < .492$ ), hard systems thinking ( $p < .384$ ), soft systems thinking ( $p < .696$ ) and critical systems thinking ( $p < .620$ ) as shown in Table 5.4. The results suggest that emancipatory systems thinking construct correlates with all systems approach sub-components of the proposed framework. The results suggest that emancipatory systems thinking construct and other systems approaches sub-components complement each other's weaknesses.

#### **5.6.8 Critical Systems Thinking Correlation Results**

The critical systems thinking construct has a strong and significant correlation with stakeholder participation ( $p < .419$ ), sociological paradigm ( $p < .608$ ), hard systems thinking ( $p < .378$ ), soft systems thinking ( $p < .648$ ) and critical systems thinking ( $p < .620$ ) as shown in Table 5.4. The results suggest that critical systems thinking construct correlates with all systems approach sub-components of the proposed framework. The results suggest that critical systems thinking and other systems approach sub-components complement each other's weaknesses. The correlations results confirm the importance of the framework components as they have a relationship based on strong positive significant correlation results. Having discussed the correlation results of the framework constructs, the next section undertakes a stepwise regression analysis to analyse the predictive power of other framework constructs on IT governance.

### **5.8 Regressions Analysis on IT Governance**

The stepwise regression analysis was used to assess which constructs had an influence on the IT governance construct. It first input independent variables of other constructs against the IT governance dependent variable. When IT governance is the dependent variable, the stepwise regression results suggest that only hard system thinking and stakeholder participation has a significant positive predictive effect on IT governance, with soft system thinking having a slightly negative impact (see Table 5.5). The overall model explained 43 percent of variance in IT governance, which was revealed to be statistically significant,  $F(3, 86) = .432, p < .000$ .

An inspection of individual predictors revealed that stakeholder participation, hard systems and soft systems constructs are significant predictors of IT governance. The other constructs had no impact on IT governance construct. Significant variables are shown below. The other constructs were significant predictors for the IT governance framework (APPENDIX: K).

Table 5.5: Regression Analysis

Predictor Variable	Beta	P
Stakeholder participation component	.453	.000
Hard systems thinking component	.376	.000
Soft systems thinking component	-.188	.043

Sample (n=90)

According to the results in Table 5.5, stakeholder participation and hard systems thinking constructs would predict positive impacts on participants' perception of IT governance in organisations. On another note, the results show that soft systems thinking has a slight negative impact on IT governance construct. The results suggest that stakeholder participation and hard systems thinking are stronger predictors of IT governance perception in the organisations. The results of this study are consistent with Cordoba's (2009) notion of the importance of stakeholders in IT adoption in organisations (see section 2.6).

The results from the regression analysis indicate that the three constructs of the framework (stakeholders participation, hard systems thinking and soft systems thinking) statistically influence the IT governance perceptions in organisations. Stakeholder participation emerged as a significant predictor of IT governance. The hard systems thinking also proved to be a significant influence of IT governance perception. The soft systems thinking indicated to be a slightly negative significant predictor of IT governance. The results suggest that other constructs are not significant predictors of the IT governance construct of the framework. Although the other constructs are not significant predictors of the IT governance construct, they had a strong positive correlation with significant predictors (stakeholder participation, hard systems thinking and soft systems thinking). The results therefore suggest that all constructs are important components of the proposed IT adoption governance framework. The results augment the importance of stakeholder participation in IT adoption in organisations.

## 5.9 Discussion

The results suggest that, on average, respondents supported the proposed IT governance

framework components. This is based on the fact that all the constructs scored above average means from a score of 1, the lowest, to 5, the highest. The frequency results show that most respondents agreed on most variables of the components. TAM had the highest score which supports literature that it is the most popular model for individual IT adoption. However further correlation analysis revealed that despite its high score, TAM had no association with other constructs suggesting that it is not an important component of the proposed IT adoption governance framework as shown in Table 5.3.

The t-test results suggest that there are significant differences between the company and the IT governance construct, as well as between gender, soft systems thinking and critical systems thinking constructs, involvement in IT adoption and critical systems thinking. The analysis of variance (ANOVA) results also indicated significant differences between department demographic variable against stakeholder participation construct and hard systems thinking construct. The education level variable showed significant differences between IT governance and stakeholder participation. The number of years in the company also indicated significant differences with soft systems thinking and emancipatory systems thinking constructs. The results support the literature that stakeholders have different worldviews about IT adoption in organisations. Figure 5.10 gives a summary of the correlation of IT adoption governance framework constructs.

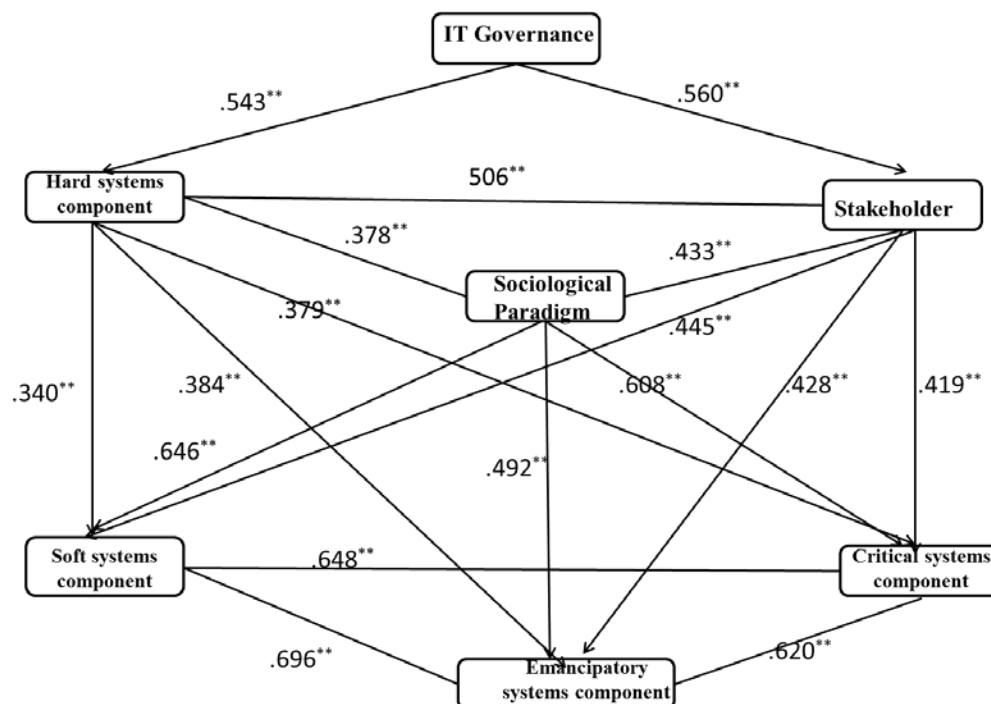


Figure 5.10: Correlation Results Summary (\*\*  $P > 0.001$ ).

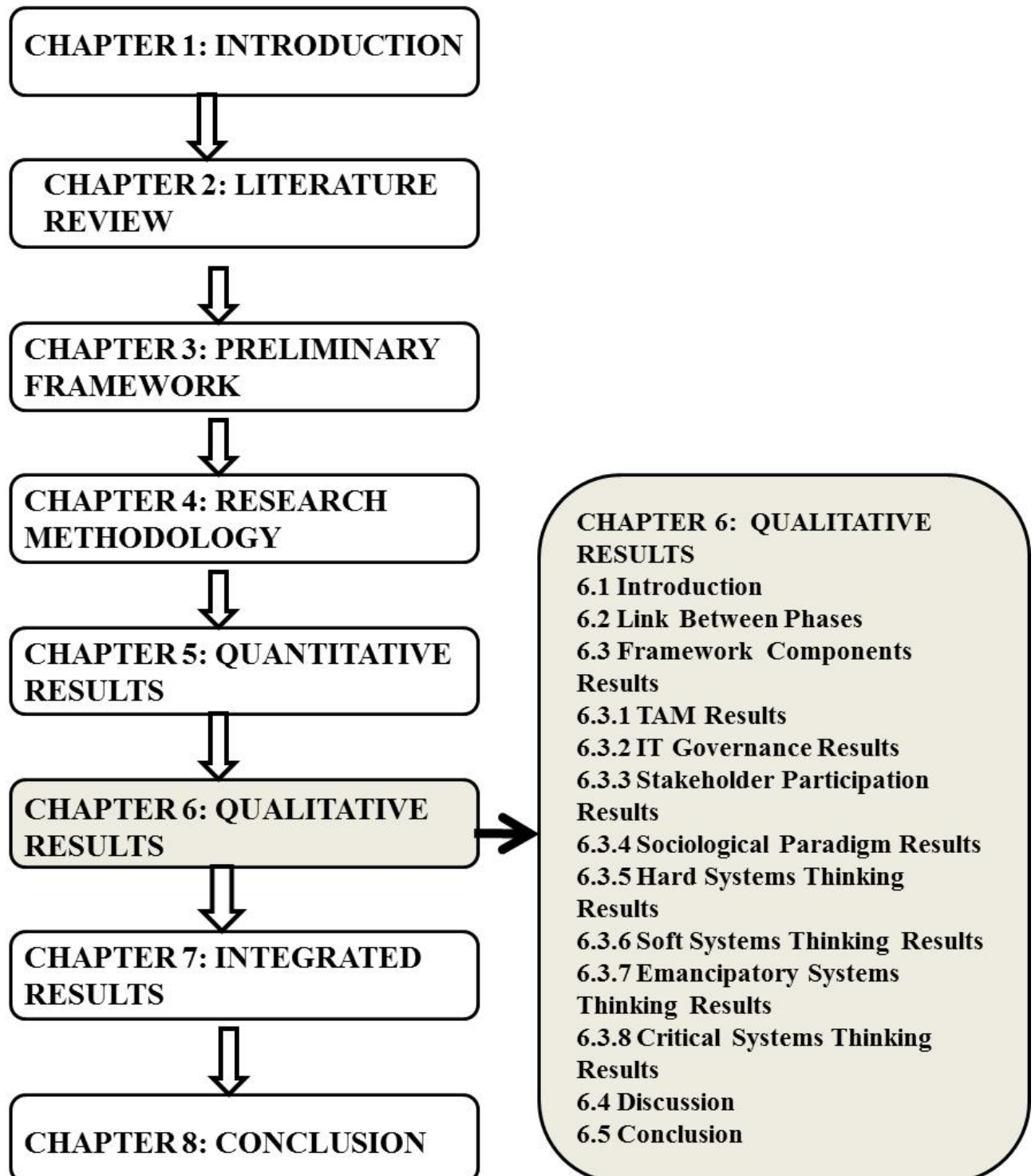
Although the IT governance construct had the lowest score, it had strong positive associations with the hard systems thinking and stakeholder participation constructs as show in Figure 5.10. The results suggest that IT governance construct perception can be improved when there is an improvement in the hard systems thinking and stakeholder participation constructs. In order to improve IT governance perception in organisations it may therefore be necessary to improve hard systems thinking and stakeholder participation perception constructs in organisations. This was also supported by the regression analysis which indicated that hard systems thinking and stakeholder participation constructs are strong predictors of IT governance constructs. The results support literature in that the components of the framework may complement each other.

Although other constructs did not have a predictive power and strong significant correlation with IT governance construct, they had an association with predictors (hard systems thinking and stakeholder participation) of the IT governance construct. The results indicated that other constructs, except TAM, have an association with predictors (hard systems thinking and stakeholder participation constructs), which is important in that they have an influence on the predictors of IT governance construct. Regarding the relationship between constructs, TAM showed that it did not have a relationship with other constructs of the framework. In other words, TAM does not have a contribution to the proposed IT adoption governance framework and is therefore not an important component.

## **5.10 Conclusion**

In summary, the quantitative results seem to suggest that the framework components are useful for improving IT adoption governance in organisations as they address different concerns during IT adoption. The results also suggest that the proposed framework is useful in that it can influence IT adoption results in organisations based on predictive constructs of the framework. Only the TAM component had no contribution to the proposed IT adoption framework since it did not correlate with other constructs. Figure 5.10 shows the summary of the construct relationships which are important to refine the proposed IT adoption governance framework. This section discussed the quantitative results from the questionnaires filled by respondents. The next chapter discusses results of the qualitative interview phase, which will assist in understanding some of the inconclusive results from the quantitative results.

## CHAPTER 6: DIAGRAMMATIC OVERVIEW



## CHAPTER 6: QUALITATIVE RESULTS

### 6.1 Introduction

The previous chapter presented the quantitative research results from the questionnaire data collected from the two organisations. The results from the previous chapter included the different statistical results from quantitative analysis. This chapter presents the qualitative results from data collected from participants using semi-structured interviews. The qualitative interview phase was a follow-up to the quantitative phase. The purpose of the qualitative phase was therefore to expand on the results gained from the first quantitative phase. The qualitative results were useful to triangulate some of the quantitative results in order to make them more credible. The qualitative interview results also managed to answer some questions that could not be answered by the quantitative results.

### 6.2 Link between Phases

The quantitative results were used to purposefully select the participants for the qualitative phase and develop the interview protocol for the second phase. The qualitative phase participants were selected from the quantitative phase sample using a stratified purposive sampling strategy to answer the research question. The purposive sampling helped to select a few participants who could provide valuable information related to the research question. The sample size was twelve participants who were purposefully selected from the two companies with assistance of the gatekeepers. Table 6.1 shows the profiles of the interviews. All interviews were individual semi-structured, lasted approximately 60 minutes and were tape recorded with participant's consent.

Table 6.1 Interviewee profiles (n=12)

Interviewee position	Number of interviewees	Organisation
Finance Manager	2	One from each organisation
IT Manager	2	One from each organisation
Warehouse Staff	2	One from each organisation
Sales Staff	2	One from each organisation
Administrative Staff	2	One from each organisation
Accounts Clerks	2	One from each organisation

The qualitative interview phase was important as a follow up to investigate the inconclusive quantitative results. The quantitative results indicated significant differences on certain



variables such as gender, department, education and number of years in the organisation. The next section discusses the qualitative results of the IT adoption governance framework components.

### **6.3 Framework Components Results**

The next section presents the qualitative results of the IT adoption governance framework components from the interviews. The participants from the two companies were interviewed to find out their perception of the components of the proposed IT adoption governance framework to assist organisations with IT adoption decision making. The next section presents the results from the interviewed participants.

#### **6.3.1 TAM Qualitative Results**

The qualitative phase supported that user experience and usefulness of systems are very important factors to IT adoption in organisations. The interviewed participants highlighted that the cost aspect of the system was important to the IT adoption in organisation as it determined affordability. In support of the TAM construct most participants from the qualitative phase noted that they expected the new system to be user-experience, efficient, affordable, effective and secure. Most participants pointed out that the new systems must have new features, functions and trial phase before adoption which are variables of the TAM construct.

Most of the interviewed participant highlighted that they expected the new system to be user-experience, efficient, affordable and secure. The participants added that they expected new features, functions and an opportunity to do a trial run before the new system was adopted by the organisation. Most of the interviewed participants noted that they needed education, training and support after the adoption on the new system in the organisation. Training manuals were also important as users would consult them in order to remind them of the material after the training.

Security was highlighted as important for the system not to be compromised. Interviewed participants noted that they needed to know the duration of changing over to the new system including training to be able to plan. The new system was expected to be more efficient and have local support to resolve problems without too much downtime affecting the organisation. In some cases it might be necessary for the organisation to hire new personnel

to address the skill gaps in the organisation. The following quotes from the interviewed participants support the above views on stakeholders' expectations during IT adoption in organisations. Cost was also seen as an important factor on IT adoption in organisations.

The following quotes from the participants support the above mention views.

**Participant 1 (Accounts Clerk)**, *“Security of the new system is important to avoid compromising the system by unauthorized users”. “When an organisation is adopting a new system, I would like to see proper training of users and the availability of training manuals. During training, one is not able to absorb everything and training manuals are important to users. Training is important to familiarize the users with the new system features. Security is important to avoid the system from being compromised by unauthorized users. The system must allow automatic password expiry after a number of days. Helpdesk is important for assisting users who experience problems with the new system during the initial phases”.*

**Participant 2 (IT Manager)** *“The new system features and functions are important to the users”. “The new system must have new features and functions.”*

**Participant 3 (Finance Manager)** *“When an organisation wants to adopt a new system, it needs to know if they have the human skills to use the system. Training of users is an important issue when considering adopting a new system. Sometimes it may be necessary to hire new personnel to fill the skills gaps in the organisation. The new system must have local support to help the organisation if there are problems with much loss of productivity”. “The organisation must to see if it can afford the new system.”*

**Participant 4 (Administrator)** *“An organisation’s plan to adopt a new system needs to consider training of users, how the implementation will be done and how support will be provided by the service provider”.*

**Participant 5 (Finance Manager)** *“Cost is also important as the new system has to be within the budget of the organisation.”*

**Participant 6 (Debtors Clerk)** *“The new system features and user training are important issues to consider when adopting a new system. In addition, users need to know how long it will take to do the changeover including training of users on the new system”. “It*

*is important for the organisation to consider if it can afford the cost of the new system.”*

**Participant 7 (Bookkeeper)** *“The new system needs to have more features and security. It must also be easier to interoperate with other systems. There is need for a trial phase for the new system for users to test and compare before the adoption phase”.*

**Participant 8 (Sales Clerk)** *“What I want first and foremost from the new system is user friendliness and efficiency compared to the old system. A trial phase is important before adoption to compare the benefits against the old system”. “I want the new system to be user friendly, efficient and be with a trial phase”.*

**Participant 9 (Sales Manager)** - *“As a user, I want similarities between the old and new systems to make it easier to use new system”.*

**Participant 10 (Stores supervisor)** *“The new system needs to be user friendly for users to adapt faster and be productive. Training is more important to other users than involving them all the time during IT adoption in organisations”.*

**Participant 11 (IT Manager)** *“From my own experience, if users feel that the new system makes their work easier and efficient, they will welcome the changes associated with adopting the new system. Educating the users about the technologies on the market is important as it empowers them to make informed decisions. Prototyping during the development phase helps to have a system that meets users’ needs. Training and education is important for the success of IT adoption in organisations as it reduces fears among the users”.*

**Participant 12 (Administrator)** *“Training can be done for super-users to train others in their respective departments. The users have to adapt and learn the new system different from the old system - which is a challenge”.*

The quantitative and qualitative findings were consistent with findings from other research obtained from literature. For instance; the quantitative and qualitative findings support the literature on the perceived usefulness and ease of use on individual IT adoption decision making (Benbasat et al., 2007). This explains also why the TAM construct had the highest

mean among all the constructs of the framework. The challenge to TAM is its inability to handle diverse perceptions of stakeholders and its deterministic approach (Lawrence, 2010). TAM is therefore more suitable for in an individual context rather than in an organisational context with multiple stakeholders. The perceived usefulness of the TAM construct is subjective from an organisational context; since individuals have different perceptions of the utility of technology (see section 2.2).

In addition, the application of TAM to IT adoption is not clear about which features are perceived as being useful or not, in order to improve the design (see section 2.2). Although other factors such as age and gender have been seen to have some effect on TAM, this was not the case in this study. The shortcoming of TAM is its over-dependence on the predictive nature of the cause-effect relationship of a deterministic approach to a social phenomenon like IT adoption in organisations. The constant change of IT in organisation becomes a challenge to TAM (see section 2.2).

### **6.3.2 IT Governance Qualitative Results**

The qualitative findings revealed that business benefits, requirements and nature of improvement should drive IT adoption decision making in organisations. Most participants who were interviewed felt that IT and business objectives should be aligned in support of the IT Governance constructs. In addition most participants supported that IT adoption benefits were seen differently by stakeholders and were difficult to quantify. Participants noted that consensus on IT adoption objectives was important but difficult to achieve. The participants also highlighted the importance of involving stakeholders in IT adoption decision making in organisations. Most of the interviewed participants felt that IT adoption in organisations must be driven by business requirements. They felt that there had to be business benefits and improvements associated with IT adoption in an organisation. The IT adoption business benefits had to be aligned with the main organisational objectives.

**Participant 1 (Accounts Clerk)** *“I think IT adoption in organisation must be evaluated in terms of meeting organisational objectives and needs”.*

**Participant 2 (IT Manager)** *“The business needs and expected benefits must drive IT adoption decision making in organisations. In addition the organisation must afford the new system.”*

**Participant 3 (Finance Manager)** *“Keeping records in manual systems may prove cumbersome as they are difficult to access.”*

**Participant 5 (Finance Manager)** *“A proper research is required to see if the new system will meet the business objectives. The new system is expected to meet the needs of the organisation. The most important point to consider is whether the new system will suit the needs of the entire organisation.”*

**Participant 6 (Debtors Clerk)** *“I think it is important to consider an organisation’s interests when adopting a new system.”*

**Participant 10 (Stores supervisor)** *“The new system to be adopted must be able to work for the organisation. The decision to adopt must consider the organisation as a whole.”*

**Participant 11 (IT Manager)** *“The adopted new system must benefit the entire organisation.”*

**Participant 12 (Administrator)** *“The important thing to consider is that the new system must bring some kind of improvement to the organisation. As such, there has to be some improvements compared to the old system to the organisation. The organisations need to have objectives and know what it wants to achieve with the new system.”*

The above quotes suggest that there was strong consensus among the interviewed participants on the importance of aligning IT adoption decision making to business objectives when adopting a new system. This supports the IT governance framework which emphasises the importance of aligning IT objectives to business objectives. The qualitative results showed that IT adoption objectives in organisation were not always clear, meaning there was always a lack of communication to stakeholders during IT adoption in organisations. The qualitative results suggest the need for improved communication with stakeholders during IT adoption. The above quotes support that the interviewed participants value the importance of IT adoption in meeting business objectives and needs.

The findings are consistent with IT governance frameworks which emphasises the need for

alignment of IT and business objectives, stakeholders' participation and the need of IT adoption to meet business objectives and needs. The quantitative and qualitative findings support literature which states that most IT governance initiatives have not been in conformance to, but rather against users' needs (Holck et al., 2005). The findings also support the need for relationship mechanisms (dialogue between IT, Business and stakeholders) during IT adoption decision making in organisations (De Haes et al., 2008). The lowest mean for IT governance compared to other constructs supports the literature which states that IT governance is a complex undertaking and difficult to implement in organisations (Bhattacharjya et al., 2009).

Peterson (2009) criticises the reductionist approach to IT adoption as it poses serious challenges to complex modern organisations. The findings support Ven et al. (2006) who noted the need to promote engagement and participation of stakeholders during IT adoption in organisations. The challenge of IT adoption is the different stakeholder constituencies who disagree on goals and how to achieve them. Peterson (2009) highlights the need for different paradigms to offer multiple insights into the complex IT adoption decision making phenomenon in organisations. This is supported by Calder (2005) who argues that there are no one-size-fits-all IT governance solutions to organisations. The study findings showed that the stakeholder construct is a significant predictor of IT governance which means it has an influence on IT Governance in organisations (see section 2.6).

### **6.3.3 Stakeholder Participation Qualitative Results**

The qualitative findings were consistent with the quantitative results with participants who were interviewed supporting the need for consultation and involvement of stakeholders during IT adoption decision making in organisations. The interviewed participants felt that stakeholder involvement helped to get buy-in, reach consensus, resolve conflicts and reduce user resistance. Most participants felt that IT committees could be useful during IT adoption to represent the interests of different departments in the organisation. The participants felt that consultation and involvement increased the buy-in of stakeholders to the IT adoption process in the organisation. In addition, the consultation was also seen as a way of improving communication with stakeholders during IT adoption in organisations. The following quotes from the interviewed participants support the above views on the importance of stakeholders' consultation during IT adoption in organisations.

**Participant 1 (Accounts Clerk)** *“If the benefits of IT adoption are not clearly communicated, there will be a negative attitude towards the new system. IT committees are important in IT adoption as they help to evaluate the new system in terms of meeting the business objectives and needs. The IT committees help to assess what the new system can do and provide an overview to the executive and other interested parties. The representation of departments in the IT committee helps to get their buy-in to IT adoption”.*

**Participant 2 (IT Manager)** *“It is always important to involve users as they are the ones who request the new system in most cases in the organisation. IT committees are important in determining business needs of the new system.”*

**Participant 3 (Finance Manager)** *“The best way to go is to have an IT committee which will have some consultative meetings with the affected users before implementing the new system. The committee will help to steer the implementation of the new system right from the consultative meeting until a stage is reached where everybody is happy with the new system. It is important for the users to be involved from the beginning if they are to be affected by the new system. The acceptance of the system requires their involvement from the start.”*

**Participant 5 (Finance Manager)** *“The involvement of stakeholders in IT adoption is important to get their buy-in to the process. The user involvement is important for them to understand what the new system will achieve for the organisation. IT adoption does not necessarily require the involvement of users with IT knowledge but also other users to know what to expect from the new system as they are the ones who are going to work with the system.*

The qualitative results are consistent with the findings from the literature review on stakeholder participation. The findings from the qualitative interviews support the literature that IT adoption benefits are not obvious to all stakeholders in organisations. The findings support that stakeholder participation is important to the success of IT adoption in organisation (Pan, 2005) as shown by high frequencies on the need for stakeholder consultation and involvement. Bernroider (2008) & Mirza (2010) also note that IT adoption failure is attributed to the independent design away from the stakeholder who uses the system.

A bottom up approach has been seen as a solution as stakeholders closer to the problem situation must provide the inputs to IT adoption decision making (Beale, 2007). Pan (2005) concurs that many researchers associate IT adoption failures with not satisfying stakeholder demands. Pouloudi (1990) notes that many researchers have highlighted the importance of stakeholders in IS decision making in organisations. In addition, he notes that IS success is not only dependent on technical aspects but also has social aspects. Checkland's (1981) soft system methodology has been used extensively as a tool for stakeholder identification in IS projects. However some researchers have criticized it as inadequate and argue that it needs to be integrated with stakeholder analysis. The integrated framework will mean that SSM will address the "what" question and the stakeholder analysis the "how" aspect of IT adoption in organisations (see section 2.7).

### **6.3.4 Sociological Paradigms Qualitative Results**

The qualitative findings supported the quantitative results as most interviewed participants felt that it was important to reach a compromise on different perceptions during IT adoption decision making in organisation. The different perceptions on IT adoption may require debates between the affected and the involved to share their perception on the problem situation in the organisations (see section 2.8).

**Participants 3** *Communication with various stakeholders is important to advise them of the disruption to be caused by changing the system. Everybody needs to know what is going on during IT adoption in the organisation whether they are involved or not. Communication is very important to those who may feel marginalised during IT adoption in organisations".*

**Participant 7 (Bookkeeper)** *"It is important to consider IT adoption after exhaustive consultation with different stakeholders in the organisation. Consultation is very important to get feedback from people who are going to use the system in terms of their perception. Everybody needs to be consulted regardless of their IT knowledge for them to feel part of the process of getting consensus and their buy-in".*

**Participants 11** *noted that stakeholder debates during IT adoption in organisations help to bring everyone to the same level of the understanding as they might have different worldviews.*



The quantitative and qualitative findings are consistent with findings in the literature review on the sociological paradigm construct. The quantitative and qualitative findings support literature which states that sociological paradigms offer a way to look at IT adoption from different perspectives and accounting for the nature of reality. In many cases the problem situation is aligned to one of the four paradigms. Each paradigm emphasises different sources of data and analytical approaches to the IT adoption problem situation. The onus is therefore on the decision makers to see the appropriate paradigm based on context. Some situations may require a functionalist paradigm to achieve efficiency and effectiveness or interpretive paradigm to reach consensus and agreement (see section 2.8).

### **6.3.5 Hard Systems Thinking Qualitative Results**

The qualitative results were consistent with the quantitative results as they indicated that some IT adoption benefits are difficult to quantify, predict and may take long to realize. They revealed that some of the benefits associated with IT adoption are soft, which cannot be quantified. Issues of efficiency and effectiveness were highlighted and this is consistent with the quantitative findings as important to IT adoption in organisations. The quantitative and qualitative findings are consistent with findings in literature as issues of efficiency and effectiveness still preoccupy most managers in organisations (Jackson, 2010).

**Participant 3 (Finance Manager)** *“The new system is expected to improve how they work with the current system”.*

**Participant 4 (Administrator)** *“Predict IT adoption outcomes is a potential risk because of various factor such user skill and knowledge can be a challenge during the process”.*

**Participant 10 (Stores supervisor)** *“The important things to consider when adopting new system in an organisation is make sure that the new system brings improvement compared to the old system”.*

The statistical procedures which help to achieve prediction and control are still being used by managers to achieve organisational goals. The business benefits were seen as difficult to quantify and predict by most interviewed participants. In addition, participants noted that the benefits may take long to realize from the adopted system. Most of the benefits associated with the adopted system are soft benefits making them difficult to quantify (see section 2.9.1). The qualitative findings concur with the literature in that hard systems are suitable for situations with unitary objectives and goals.

Hard systems thinking approaches have been successful in solving many operational issues in organisations, which are associated with improving efficiency and effectiveness. The findings also challenged the view that in IT adoption, it is rare for stakeholders to have unitary goals and objectives (see section 2.9.1). The hard systems thinking approaches, therefore, provides a limited view of the IT adoption reality in organisations.

The success of hard systems thinking has been attributed to its use of statistical models but some problems may not be reduced to forms applicable to the use of mathematical models due to complexity of the problem nature. In addition, most IT adoption problems cannot be solved by decomposing them into independent problems, rather they need to be viewed holistically (Katy et al., 2010). The cause and effect relationship of hard systems thinking has limited application to complex IT adoption problem situations in organisations. Hard systems thinking approaches are not able to handle pluralism and coercive problem situation in organisations (see section 2.9.1).

#### **6.3.6 Soft Systems Thinking Qualitative Results**

The qualitative findings from interviews support the quantitative results as participants noted that IT adoption benefits were seen differently by stakeholders with different perspectives. This is consistent with soft systems thinking objectives of promoting subjectivity during IT adoption in organisations. In addition, issues of involvement, consensus, debates, conflicts and accommodation of worldviews were highlighted by participants, which justify the need for a framework to address the issues.

Interviewed participants noted that the benefits were seen differently by stakeholders who have different perceptions. The participants who were interviewed felt that the debates were important during IT adoption to help reach consensus, resolve conflicts and reduce resistance to change during IT adoption in organisations. Most participants felt that IT committees were important during IT adoption as they represented interests of different departments in the organisation.

**Participant 5 (Finance Manager)** said that *“debates during IT adoption are important to allow everyone a fair opportunity to provide their perception. Involvement is seen as a way to get stakeholder buy-in to IT adoption in organisations. Debates during IT adoption are*

*important to allow everybody a fair opportunity to provide their perceptions. Although it is important to have consultation during IT adoption in organisations, in most cases decisions are imposed on the users without consulting them”.*

**Participant 6 (Debtors Clerk)** said that *“Communication with various stakeholders is important to advise them of the disruption to be caused by changing the system. Everybody needs to know what is going on during IT adoption in the organisation whether they are involved or not. Communication is very important to those who may feel marginalised during IT adoption in organisations”.*

**Participant 7 (Bookkeeper)** *“It is important to consider IT adoption after exhaustive consultation with different stakeholders in the organisation. Consultation is very important to get feedback from people who are going to use the system in terms of their perception. Everybody needs to be consulted regardless of their IT knowledge for them to feel part of the process of getting consensus and their buy-in”.*

**Participant 8 (Sales Clerk),** *“It is important to consult users before decisions are made on IT adoption in organisations. In most cases users who are going to use the system are rarely consulted during IT adoption in organisations. Users with both IT and business knowledge are important in IT adoption decision making in organisations”.*

**Participant 9 (Sales Manager),** *“In most cases users are not consulted during IT adoption in organisations. The important issues during IT adoption are communication, consultation and involvement of different stakeholders in the organisation. A committee of representatives from all departments needs to be involved in IT adoption decision making in an organisation”.*

**Participant 10 (Stores supervisor)** *“Users need to be involved as they are the ones going to use the system all the time. The users’ involvement will help to get their input to what they expect from the new system”.*

**Participant 11 (IT Manager)** *“It is important to hold interview sessions with users as part of involving and understanding their needs during IT adoption in organisations. The involvement of users in interview sessions will help to get their buy-in of the new system. It is also important to consider awareness campaigns when an organisation is adopting a new*

*system for users to know what is going on. Stakeholders' debates during IT adoption in organisations help to bring everyone to the same level of understanding as they might have different views. The discussion forums are important to reduce conflicts and ironing out grey areas. A higher level committee is important in coordinating user involvement sessions during IT adoption in organisations”.*

**Participant 12 (Administrator),** *“The involvement of key stakeholders is important for the success of IT adoption in organisations. If management involves users from the beginning, they will accept the new system as they will know why the decision was taken in the first place. There is a need to involve various stakeholders during IT adoption decision making in organisations”.*

The qualitative findings are consistent with finding in literature with regards to benefits of soft systems thinking to IT adoption. The qualitative findings support the need for subjectivity and pluralism during IT adoption decision making in organisations. The soft systems thinking assumption is that IT adoption problem situations are concerned not only with technical issues but also with social issues since humans are part of the whole process.

The soft systems thinking helps to bring subjectivity to multiple stakeholders' views to IT adoption in organisations (see section 2.9.2). The findings support the literature in that the soft system is useful to accommodate different stakeholder views, get buy-in and consensus during IT adoption in organisations. Soft systems thinking appreciates that truth is subjective and every worldview is restrictive (Cordoba, 2009). The results support that soft system thinking helps to change individual worldviews through continuous learning and accommodation of different stakeholders' worldviews (see section 2.9.2). The soft systems thinking approaches have been criticized for failure to address problem situations of a coercive nature. The soft system has limited application to problem situations characterised by conflicts and unequal access to power (see section 2.9.2).

### **6.3.7 Emancipatory Systems Thinking Qualitative Results**

The qualitative analysis was consistent with quantitative results with interviewed participants acknowledging the existence of unfairness, marginalization, coercion and power politics as being common during IT adoption in organisations. Participants noted that some departments were seen as more important than others. Participants felt that certain departments, like

finance, were favoured when it came to resource allocation in organisations. Most participants concurred that in most instances new systems were imposed on them without consultation, which was a major issue.

A majority of the participants also concurred that there was always unfair distribution of resources with Finance department seen as more important. The marginalization and unfair treatment of other departments created a lack of trust which affected IT adoption in organisations. Trust is very important to the success of IT adoption in organisation as it requires buy-in from various stakeholders. The imposition of the new system to users without consultation may result in user resistance. The following quotes from the interviewed participant supports the above views on stakeholders' expectations during IT adoption in organisations.

**Participant 4 (Administrator)** *“Conflicts on IT adoption in organisation are always there, but can be resolved by consultation and communicating with the affected parties. IT committees are important in that they help to have different opinions and perspectives to IT adoption in organisation.”*

**Participant 5 (Finance Manager)** *“Although there should be fairness in IT adoption in some cases, the decisions are imposed on users without consulting them”.*

**Participant 6 (Debtors Clerk),** *“When there is conflict on IT adoption, it is better to consider organisational interests as opposed to individual interests. In addition, politics will always be there in IT adoption in organisations and it is difficult to keep everybody happy”.*

**Participant 8 (Sales Clerk),** *“There is always no fairness in IT adoption most of the time as other departments are marginalised during IT adoption in organisations. In most cases IT adoption decisions are made by management without involving the affected users”.*

**Participant 9 (Sales Manager),** *“In many cases other stakeholders are marginalised as they are not consulted during IT adoption in organisations. Some departments like finance are seen as more important than others during IT adoption in organisations.”*

**Participant 12 (Administrator),** *“Yes, definitely there are instances where other*

*departments are marginalised during IT adoption in organisation. In most cases Finance department is seen as more important than other departments. The marginalization results in unfair allocation of resources among departments. The unfair allocation of resources causes frustration in the affected departments”.*

Qualitative interviews showed that there were major concerns with unfair treatment of departments in organisations. The interview findings showed that certain departments like Finance were always favoured in resource allocation in organisations. In addition, most participants highlighted that power relations issues were quite common and it is important to involve influential stakeholder for IT adoption to be successful. The qualitative results are consistent with findings in literature which highlight challenges of unfairness; oppression and discrimination in organisations (see section 2.9.3). In addition to that the study noted that issues of power relations affect IT adoption in organisations (see section 2.9.3). The findings support the need for democratic IT adoption decision making in organisations without any form of alienation and oppression.

The results reveal that the situation of coercion makes it difficult to achieve democratic IT adoption decision making in organisations. The marginalised and discriminated stakeholders need to be empowered for their voices to be heard during IT adoption in organisations (see section 2.9.3). The emancipatory systems thinking approaches helps alienated and oppressed stakeholders to take responsibility for their liberation. The emancipatory systems thinking approaches questions the beneficiary of the system intervention and seeks to empower those affected by the decision taken. Emancipatory systems thinking approaches challenges the existence of unfairness in society and promotes the participation of the affected stakeholders by the decision. Emancipatory systems thinking approaches supports the idea that decisions should emanate from those affected by the change (see section 2.9.3).

### **6.3.8 Critical Systems Thinking Qualitative Results**

The qualitative results were consistent with quantitative results as they revealed that issues of diversity, coercion, oppression and politics are common features during IT adoption decision making in organisations. Most participants concurred that politics was always there during IT adoption in organisations with those with more power making the final decisions. This supports the fact that power relations are part of organisational life and have major influence on IT adoption. While participants accepted the existence politics, they argued that decision

makers must put the organisation's interests before individual interests. Participants echoed that there was no fairness in IT adoption as other departments were marginalised. The unfairness may result in frustration of the affected department. Most of the participants felt that politics existed during IT adoption in organisations. The participants felt that politics was part of organisational life and could affect IT adoption in organisations if not managed properly.

**Participant 1 (Accounts Clerk),** *"Yes, there is always politics during IT adoption in organisations and it is important to put an organisation's interests before individual ones".*

**Participant 2 (IT Manager),** *"Organisations should have processes in place to reduce political influence and imposing new system without evaluation".*

**Participant 3 (Finance Manager),** *"Politics which is relationships between people or departments and who makes decisions is very important during IT adoption in organisations. If you do not consider influential parties in the decision making, the new system might end up being sabotaged and fail. In some organisation, you might find out that the Finance department is very powerful and whatever they say carries the day".*

**Participant 11 (IT Manager),** *"Politics and power relations can affect IT adoption in organisations as humans by nature; we do not want systems to be imposed on us. If the new system is imposed on the users, it may result in negative impacts on the adoption process".*

The findings from the qualitative phase are consistent with literature in that at times IT adoption may require more than a one system approach intervention. This may be the case when the problem situation is embedded with many sub-problems which one approach may be incapable of handling (see section 2.9.4). The qualitative findings support that there is need for complementarities of approaches during IT adoption in organisations as one approach may not be sufficient. The diverse nature in organisations may require adoption to be viewed using different paradigms to understand the problem situation.

The critical systems thinking accepts hard systems thinking and soft systems thinking as equal partners during IT adoption decision making in organisations. The hard systems thinking has strengths in addressing operational issues of efficiency and effectiveness, whilst soft systems thinking helps to address social issues associated with IT adoption in

organisations (see section 2.9.4). The research findings support that IT adoption has technical, social and political issues to be addressed. Critical systems thinking approaches are suitable for addressing technical (how), social (what) and political (why) IT adoption challenges in organisations. This shows that critical systems thinking addresses the inadequacy of other system approaches (hard and soft) during IT adoption decision making in organisation (see section 2.9.4).

#### **6.4 Discussion**

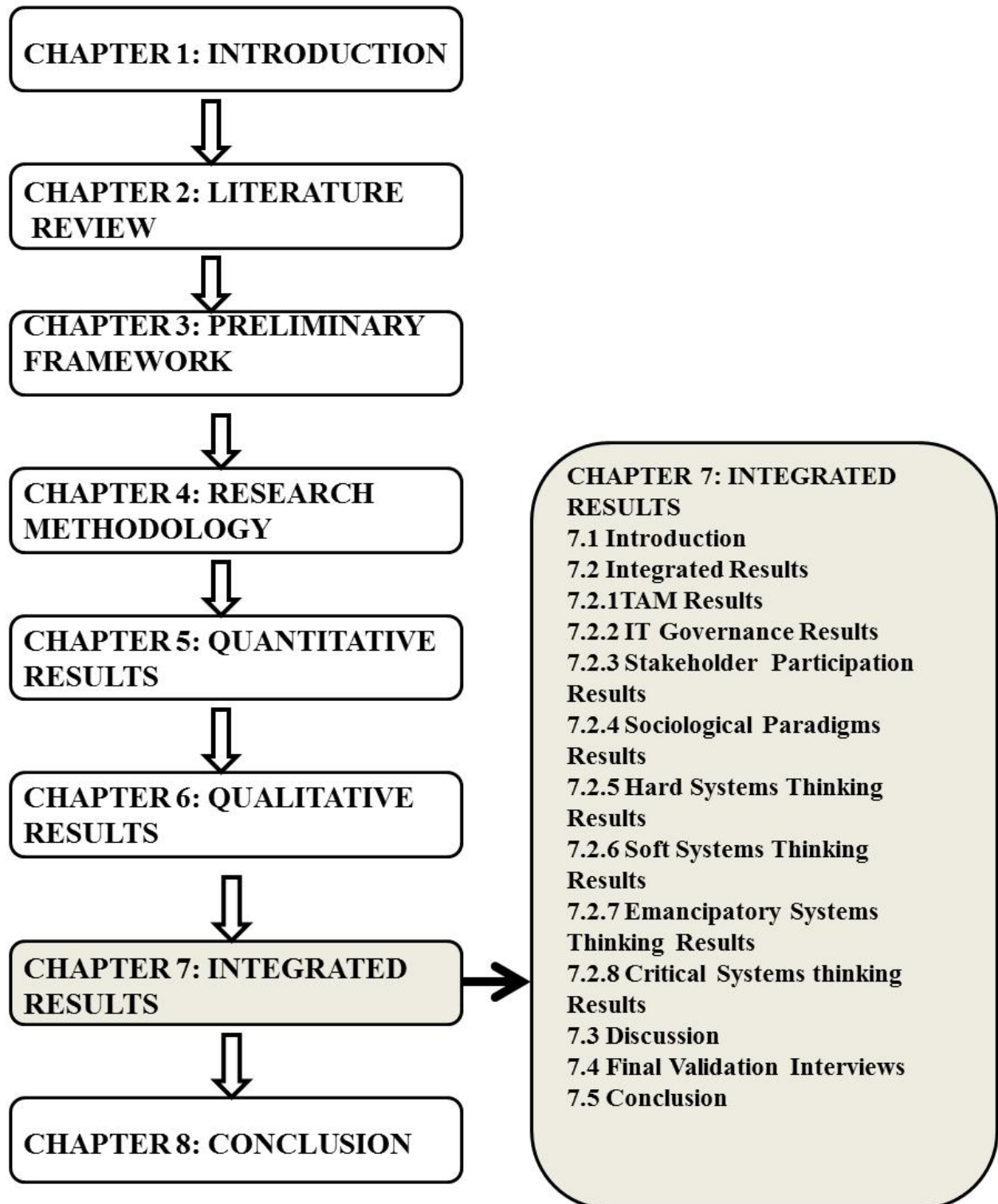
The qualitative findings supported the quantitative results from the previous chapter. In addition, the qualitative phase helped to answer some of the inconclusive questions of the quantitative phase. While the quantitative phase managed to solicit the participants' perceptions on IT adoption decision making, the qualitative phase added another dimension by getting information to substantiate why they say so. This was important in validating a developed framework as that was intention of the study. The qualitative phase managed to answer why participants had different perceptions of IT adoption decision making in organisations. Therefore the qualitative phase added completeness to the study which is the advantage of the mixed methods research method.

#### **6.5 Conclusion**

This chapter presented the qualitative results from the interviewed participants from the two organisations. The sequential explanatory mixed methods research helped to give a deeper and holistic insight regarding participants' perceptions of IT adoption decision making from what they said, from quantitative results, and why they said it from the qualitative results. The sequential explanatory mixed methods research did not therefore focus only on what the participants said but also why they said it. The qualitative phase helped to find answers for some of the inconclusive quantitative phase results. The qualitative phase was therefore important to explore some of the inconclusive results from the quantitative phase using interviews to solicit participants' views as expressed in their own words. The next chapter presents the integrated results from the qualitative and quantitative phases which are part of the mixed methods research. In addition, the integrated results from the quantitative and qualitative results are important to assist with refining the developed IT adoption governance framework.



## CHAPTER 7: DIAGRAMMATIC OVERVIEW



## **CHAPTER 7: INTEGRATED RESULTS**

### **7.1 Introduction**

The previous chapter presented the qualitative results which were important to provide some explanation to some of the inconclusive quantitative results. The previous chapter managed to explain inconclusive results that could not be answered by the quantitative phase. The purpose of the study was to develop and validate the IT adoption governance framework to assist organisations with IT adoption decision making. The sequential exploratory mixed methods research design allowed the combination of qualitative and quantitative results in a single study. This chapter discusses the integrated results of both quantitative and qualitative phases to assist fulfill the intended research objectives. Having introduced the purpose of integrated results, the next section discusses the integrated results.

### **7.2 Integrated Results**

This study's objectives were to develop and validate IT adoption governance frameworks using a case study sequential mixed methods approach (mixing qualitative and quantitative methods). The study used a mixed methods approach to collect and analyze quantitative and qualitative data (sequential explanatory design). The purpose of the quantitative phase was to help provide the bigger picture about participants' perceptions on IT adoption decision making using questionnaire data. The purpose of the qualitative phase was to help provide a deeper insight into the phenomenon by explaining the questions from the quantitative results on IT adoption decision making in organisations.

On their own, the quantitative findings do not tell the full story of IT adoption decision making challenges in organisations. The quantitative findings did not tell why there were differences in perceptions among participants from different demographic characteristics. The qualitative phase used the narratives to delve more into the differences of participants' perceptions on IT adoption decision making. The power of the mixed methods research approach was to build a holistic picture on challenges of IT adoption decision making in organisation. The next section discusses the integrated results of the framework constructs.

### **7.2.1 TAM Integrated Results**

Quantitatively, most participants scored high on TAM construct variables with usability variable ranking the highest and cost savings ranking the lowest of the variables (see Figure 5.1). Overall the TAM construct had the highest mean score (see Figure 5.9). However of the two organisations retail had a higher mean than manufacturing mean on TAM construct. The T-test and analysis of variance (ANOVA) conducted did not show significant differences between TAM and demographic variables. In addition TAM construct did not show strong and significant correlation with other constructs of the framework. The stepwise regression analysis conducted also showed that TAM had no predictive power over the dependent construct IT governance. The results suggest that TAM construct is not an important component of the proposed IT adoption governance framework.

The qualitative phase supported that usability and usefulness of systems are very important factors in IT adoption in organisations. The interviewed participants highlighted that the cost aspect of the system is important to the IT adoption in organisation as it determines affordability. In support of the TAM construct, most participants from the qualitative phase noted that they expected the new system to be user-friendly, efficient, affordable, effective and secure. Most participants pointed out that the new systems must have new features, functions and a trial phase before adoption which are variables of the TAM construct.

The quantitative and qualitative results were consistent with the literature on the importance of perceived usefulness and ease of use on individual IT adoption decision making (Benbasat et al., 2007). This explains also why the TAM construct had the highest mean among all the constructs of the IT adoption governance framework. The challenge to TAM is its inability to handle diverse perceptions of stakeholders and its deterministic approach (Lawrence, 2010). TAM is therefore more suitable for an individual context rather than an organisational context with multiple stakeholders. The perceived usefulness of TAM construct is subjective from an organisational context; since individuals have different perceptions of the utility of technology (see section 2.2). This is supported by the results in that TAM did not correlate with other constructs (see Table 5.4). The results suggest that TAM is not important to IT adoption from an organisation context where stakeholders have different perceptions on the utility of technology (see section 2.2).

### **7.2.2 IT Governance Integrated Results**

Statistically most IT governance construct variables scored the lowest compared with other constructs of the framework. The descriptive statistics showed that most participants were not pleased with the nature of IT governance in the organisation as shown by a high percentage among those who disagreed. The results suggest that IT governance is of major concern based on participant responses from quantitative and qualitative phases. It was of no surprise that IT governance ranked the lowest mean and the highest standard deviation of all the framework constructs (see Figure 5.9). This shows that the organisations have challenges with IT governance as most participants did not agree with most of the variables.

Between the two organisations the retail had a lower mean than the manufacturing company. The t-test showed that IT governance construct differed significantly between the two companies with manufacturing participants more satisfied than retail participants. In addition to that, analysis of variance (ANOVA) conducted showed that IT governance construct differed significantly among educational levels. Strangely the participants with a lower educational level were more satisfied with IT governance than the highly educated (APPENDIX: J). The results suggest that IT governance had significant differences on organisation type and education level and not significant with other demographic variables. IT governance correlated strongly and significantly with the following constructs; stakeholder participation, hard systems thinking and soft systems thinking constructs. The regression analysis results suggest that stakeholder participation, hard systems thinking and soft systems thinking are significant predictors and have influence on IT governance in organisations.

The qualitative results revealed that business benefits, requirements and nature of improvement should drive IT adoption decision making in organisations. Most interviewed participants felt IT and business objectives should be aligned in support of the IT governance constructs. In addition most participants supported that IT adoption benefits were seen differently by stakeholders and were difficult to quantify. The participants also highlighted the importance of involving stakeholders in IT adoption decision making in organisations.

The results are consistent with IT governance framework which emphasises the need of alignment of IT and business objectives (see section 2.6) and stakeholder participation during IT adoption in organisations. The results also support the need for a relationship mechanism (dialogue between IT, business and stakeholders) during IT adoption decision making in

organisations (see section 2.6). The lowest mean for IT governance compared to other constructs supports literature which states that IT governance is a complex undertaking and difficult to implement in organisations (see section 2.6).

### **7.2.3 Stakeholder Participation Integrated Results**

Quantitatively, most stakeholder participation construct variables scored highly as per participants' response. Statistically most participants were in support of stakeholder consultation and involvement on IT adoption decision making in organisations. In addition, the majority noted that there was always a lack of consensus, agreement and appreciation of IT adoption benefits by stakeholders in organisations. Generally speaking, most participants agreed that IT adoption success depended on stakeholder participation in organisations. Overall, the need to consult stakeholders during IT adoption in organisations had the highest agreed response whilst consensus and agreements on IT adoption benefits had the lowest agreed response. The results justify the need for the stakeholder participation component in the proposed framework to address issues of stakeholders' agreement and consensus during IT adoption in organisations.

The stakeholder participation construct had above mean with the retail organisation having lower than the manufacturing organisation. The analysis of variance (ANOVA) showed significant differences on the department variable and education variable with stakeholder participation. The results indicated that matriculate participants and first degree participants differed significantly on stakeholder participation. The other demographic variables did not show significant differences on the stakeholder participation construct. Stakeholder participation correlated strongly and significantly with all constructs of the proposed framework, except TAM. The results suggest that changes in these constructs are followed by changes in stakeholder participation. The regression analysis conducted also showed that stakeholder participation was a significant predictor of the IT governance construct.

The qualitative results were consistent with the quantitative results with interviewed participants supporting the need for consultation and involvement of stakeholders during IT adoption decision making in organisations. The interviewed participants felt that stakeholders' involvement helped to get buy-in, reach consensus, resolve conflicts and reduce user resistance. Most participants felt that IT committees could be useful during IT adoption to represent the interests of different departments in organisations.

The quantitative and qualitative results are consistent with the findings from the literature review on stakeholder participation in that IT adoption benefits are not obvious to all stakeholders in organisations. The results support that stakeholder participation is important to the success of IT adoption in organisations (see section 2.7). The lack of stakeholder involvement and consultation results in a gap between actual needs and official requirements (see section 2.7). Stakeholders closer to the problem situation are important to provide input during IT adoption decision making. The stakeholder participation component of the proposed framework is important to address the “how” aspect of IT adoption in organisations (section 2.7).

#### **7.2.4 Sociological Paradigm Integrated Results**

Statistically, sociological paradigm construct scored above average from the participant response. Most participants felt that social issues were important to IT adoption decision making in organisations. Most of the participants were of the opinion that stakeholders needed awareness on IT adoption benefits. Sociological paradigm had above average mean and the lowest standard deviation of all constructs. This suggests that most participants were in agreement in most sociological paradigm variables. Between the two organisations, retail had a higher mean than did manufacturing organisation.

The t-test and analysis of variance (ANOVA) conducted on the sociological paradigm construct and demographic variables did not show any significant differences. The sociological paradigm had a strong and significant correlation with hard systems thinking, soft systems thinking, emancipatory systems thinking and critical systems thinking. The results suggest that there was a relationship between these constructs and the sociological paradigm. The regression analysis conducted did not reveal sociological paradigm as a significant predictor of IT governance.

The qualitative findings supported the quantitative results as most interviewed participants felt that it was important to reach compromise on different sociological issues during IT adoption decision making in organisations. The different perceptions on IT adoption may require debates between the affected and the involved to share their perceptions of the problem situation in the organisations.

The quantitative and qualitative findings were consistent with findings in the literature review on the sociological paradigm construct which states that sociological paradigms offer a way to look at IT adoption from different perspectives and accounting for the nature of reality (section 2.8). The different sociological paradigms therefore provide guidelines for different perceptions during IT adoption decision making in organisations. The onus is therefore on the decision makers to select the appropriate paradigm suitable for the problem context at hand. Some situations may require the use of more than two paradigms to address the IT adoption problem situation in organisations (section 2.8).

#### **7.2.5 Hard Systems Thinking Integrated Results**

Statistically, hard systems thinking construct variables scored above average from the participants' responses. A majority of the participants were of the opinion that IT adoption in organisations improves efficiency and effectiveness in the organisations. However a majority of participants seemed to disagree that agreement always existed on IT adoption objectives and the view that success on IT adoption was always guaranteed. This is in contrast to the hard systems thinking assumptions that consensus always exists during IT adoption in organisations. The hard systems thinking approaches' potential to improve efficiency and effectiveness is consistent with the literature.

The hard systems thinking construct had an above average mean with retail participants having a lower mean than manufacturing participants. The analysis of variance showed significant differences between departments. This suggests that participants' perceptions were associated with departments. Hard systems thinking had a strong and significant correlation with IT governance, soft systems thinking, emancipatory systems thinking and critical systems thinking (see Table 5.4). This suggests that any change on these constructs is followed by change in hard systems thinking in the same direction. The regression analysis revealed that the hard system thinking construct had influence on IT governance construct (see Table 5.5).

The qualitative findings were consistent with the quantitative findings in that some IT adoption benefits are difficult to quantify, predict and may take long to realize (section 2.9.1). The interviewed participants added that some of the benefits associated with IT adoption were soft which cannot be quantified. Issues of efficiency and effectiveness were highlighted as important to IT adoption in organisations which is consistent with the quantitative results

(section 2.9.1). The quantitative and qualitative findings are consistent with literature as issues of efficiency and effectiveness still preoccupy most managers in organisations (section 2.9.1). The statistical procedures which help to predict and control are still being used by managers to achieve organisational goals.

The quantitative and qualitative results concur with literature in that hard systems are suitable for situations with unitary objectives and goals. The results also supported that in IT adoption it is rare for stakeholders to have unitary goals and objectives (section 2.9.1). The hard systems thinking component, therefore, is effective in IT adoption problem situations with unitary clear objectives in organisations. The cause and effect relationship of hard systems thinking has limited application to complex IT adoption problem situations in organisations (section 2.9.1). The hard systems thinking component is not able to handle pluralism and coercive problem situations in organisations.

#### **7.2.6 Soft Systems Thinking Integrated Results**

Quantitatively, soft systems thinking construct variables scored above average from the participants' responses. Most of the participants agreed with most of the soft systems thinking construct variables. Most participants agreed that stakeholders should be involved, debates were important to reach consensus and accommodate each other's different worldviews. Of particular importance to the study is the fact that most participants agreed that stakeholder attitudes towards IT adoption can be changed. The ability to change stakeholders negative perceptions on IT adoption is important its success in organisations. Positive stakeholder attitudes are associated with successful IT adoption in organisations.

The t-test conducted showed significant differences with the gender variable, with male participants more in support of soft systems thinking construct (see section 5.4). This suggests that there was an association between participant gender and perception on soft systems thinking. The analysis of variance did not show any significance with the demographic variable. Soft systems thinking had strong and significant correlation with sociological paradigm, hard systems thinking, emancipatory systems thinking and critical systems thinking. The regression revealed that soft systems thinking was a significant predictor of the IT governance construct (see Table 5.5).

The qualitative results from interviews support the quantitative results as participants noted



that IT adoption benefits were seen differently by stakeholders. This is consistent with soft system thinking objectives of promoting subjectivity during IT adoption in organisations. In addition, issues of involvement, consensus, debates, conflicts and accommodation of worldviews were highlighted by participants as important, which justifies the need of the soft systems thinking component of the framework to address soft issues during IT adoption decision making in organisations (see section 2.9.2).

The quantitative and qualitative results are consistent with literature with regard to benefits of soft systems thinking to IT adoption in organisations. The quantitative and qualitative results support the need of subjectivity and pluralism during IT adoption decision making in organisations (see section 2.9.2). The soft systems thinking assumption is that IT adoption problem situations are concerned with not only technical issues but also social issues since humans are part of the whole process (see section 2.9.2). The soft systems help to bring subjectivity and multiple stakeholders' views to IT adoption in organisations. The results support the literature in that soft system component is useful to accommodate different stakeholder views; get buy-in and consensus during IT adoption in organisations (see section 2.9.2).

#### **7.2.7 Emancipatory Systems Thinking Integrated Results**

Most of the interviewed participants agreed that issues of conflict, power relations, inequality, unfairness and coercion were common during IT adoption decision making in organisations. The participants supported the need for empowerment and representation of stakeholders on IT adoption decision making in organisations. The analysis of variance showed significant differences with number of years in the company of participants. In addition, emancipatory systems thinking had a strong and significant correlation with stakeholder participation, sociological paradigm, hard systems thinking, soft systems thinking and critical systems thinking. The regression analysis did not reveal emancipatory systems thinking as a statistically significant predictor of IT governance construct (see Table 5.5).

The qualitative results were consistent with quantitative results, with most of interviewed participants acknowledging the existence of unfairness, marginalization, coercion and power politics as being common during IT adoption in organisations (see section 2.9.3). Participants noted that some departments were seen as more important than others. Participants felt that certain departments like Finance were favoured when it came to resource allocation in

organisations. Most participants concurred that in most instances new systems were imposed on them without consultation which was a major issue.

The quantitative and qualitative results are consistent with findings in literature which highlight challenges of unfairness; oppression and discrimination in organisations (see section 2.9.3). The results reveal that there is unfairness during IT adoption in organisations. In addition to that, the study noted that issues of power relations affect IT adoption, which supports the need for democratic IT adoption decision making in organisations (section 2.9.3). The results reveal that the situation of coercion makes it difficult to achieve democratic IT adoption decision making in organisations. The marginalised and discriminated stakeholders need to be empowered during IT adoption in organisations (section 2.9.3).

#### **7.2.8 Critical Systems Thinking Integrated Results**

Statistically, the majority of the participants agreed with most of the critical systems thinking variables. Most of the participants concurred that it was important to address issues of diversity, oppression, politics, legitimacy, ethical issues and emancipation during IT adoption decision making in organisations. In addition, the participants supported the importance of identifying the affected and the beneficiary stakeholders of the IT adoption in organisations.

The critical systems thinking had an above average mean with retail participants having a higher mean than manufacturing participants. The t-test conducted showed significant differences with gender, with male participants more in support than female participants on critical systems thinking construct (see section 5.4). In addition, involved variable differed significantly with those involved more in support than not those involved. Critical systems thinking had a strong and significant correlation with stakeholder participation, sociological paradigm, soft systems thinking and emancipatory systems thinking. The regression analysis conducted did not reveal any statistical significant with IT governance construct.

The qualitative results were consistent with quantitative results as they all revealed that issues of diversity, coercion, oppression and politics are common features during IT adoption decision making in organisations (see Figure 5.8). Most participants concurred that politics was always there during IT adoption in organisations with those with more power making the final decisions. This supports the fact that power relations are part of organisational life and

have a major influence on IT adoption. While participants accepted the existence of politics they urged decision makers to put the organisation's interest before individual interest. Participants echoed that there was no fairness in IT adoption as other departments were marginalized.

The results from both quantitative and qualitative phase are consistent with literature in that at times IT adoption may require more than a one system approach intervention. This may be the case when one approach is incapable to handle a complex problem situation (section 2.9.4). The quantitative and qualitative results support that there is a need for complementarities of approaches during IT adoption in organisation as one approach may not be sufficient. This suggests that critical systems thinking addresses the inadequacy of other system approaches (hard and soft) during IT adoption decision making in organisations (section 2.9.4).

### **7.3 Discussion**

The refined framework (Figure 7.1) advocates for the need to understand the IT adoption problem context before making decisions on intervention strategies. The framework assumption is that different systems approaches are well suited for addressing different IT adoption problem contexts in organisations. The sociological component of the framework acknowledges that the one-size-fits-all systems approach is not applicable to IT adoption in organisations.

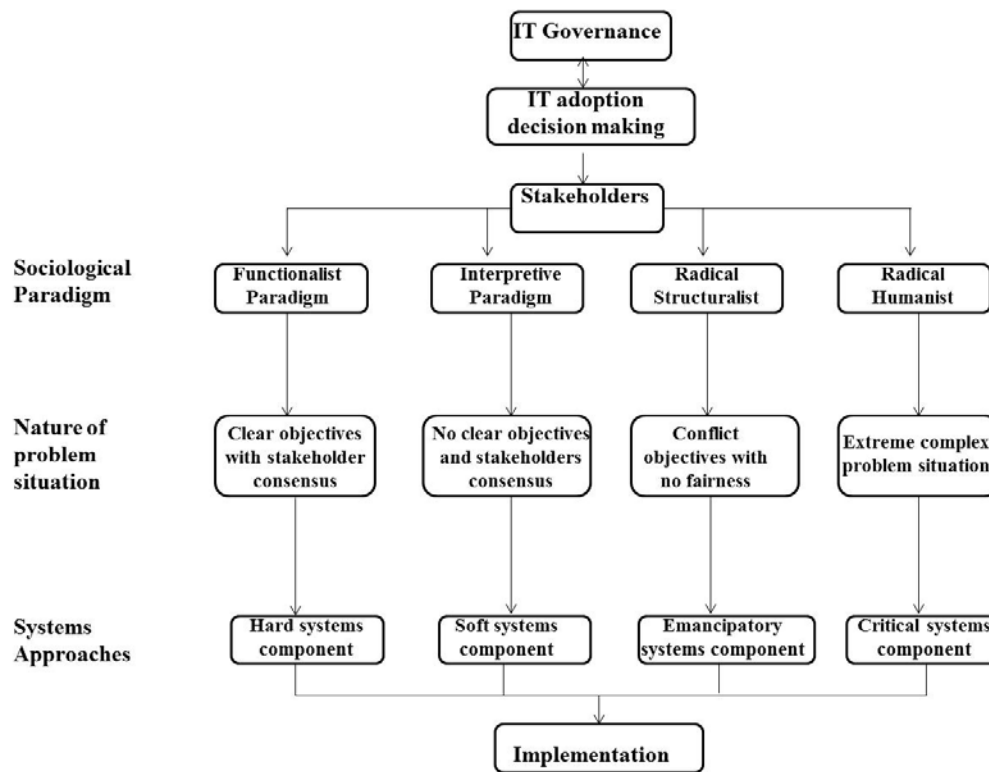


Figure 7.1 Final IT Adoption Governance Framework

The inability of the TAM component of the framework to handle diverse perceptions of stakeholders makes it unsuitable for IT adoption in organisations. The perceived usefulness of the TAM construct is subjective from an organisational context, since individuals have different perceptions of the utility of information technology. The TAM component is therefore not an important part of the framework from an organisational context where stakeholders have different perceptions the value of IT adoption.

The IT governance component of the framework (Figure 7.1) advocates the need to align IT and business objectives during IT adoption decision making in organisations. The component supports the need for a relationship mechanism between IT, Business, and other stakeholders during IT adoption decision making in organisations. The IT governance component of the framework is important in aligning IT and business objectives during IT adoption in organisations.

The stakeholder participation component of the framework (Figure 7.1) advocates the involvement and consultation of stakeholders during IT adoption decision making in organisations. The involvement of stakeholders is important to secure buy-in during IT adoption in organisations. The component assists stakeholders closer to the problem situation

to provide input during IT adoption decision making in organisations. The stakeholder participation component of the framework is important to address the “how” aspect of IT adoption in organisations.

The sociological paradigm component of the framework (Figure 7.1) advocates the selection of the most suitable systems approach during IT adoption decision making in organisations. The sociological paradigm component provides guidelines for selecting the appropriate set of systems approaches for the IT problem situation at hand. The component acknowledges that different systems approaches are suitable for different problem contexts. The assumption is that there is a fit between particular IT adoption problem contexts to a systems approach (See section 2.8).

The hard systems thinking component of the framework (Figure 7.1) is suitable for IT adoption problem contexts where stakeholders have unitary goals and objectives during IT adoption decision making in organisations (section 2.9.1). The hard systems thinking approaches use statistical methods and cause-effect relationships to achieve unitary goals and objectives in organisations. The hard systems thinking component of the framework is appropriate in addressing problems related to inefficacy and ineffectiveness in organisations.

The soft systems thinking component of the framework (Figure 7.1) is appropriate for subjective IT adoption problem contexts during IT adoption decision making in organisations. The soft systems thinking component helps bring consensus during IT adoption in organisations (see section 2.9.2). The soft systems thinking component of the framework addresses subjective problem situations with no clear objectives during IT adoption decision making in organisations.

The emancipatory systems thinking component of the framework (Figure 7.1) is appropriate for coercive, oppressive and discriminatory IT adoption problem contexts during IT adoption decision making in organisations (see section 2.9.2). The emancipatory systems thinking component helps to empower marginalized stakeholders and achieve democratic IT adoption decision making in organisations (section 2.9.3). The emancipatory systems thinking component of the framework is capable of addressing problem situations of a coercive, oppressive and discriminatory nature during IT adoption decision making in organisations.

The critical systems thinking component of the framework (Figure 7.1) is appropriate for complex diverse IT adoption problem contexts during IT adoption decision making in organisations. The critical systems thinking component supports the complementarities of

systems approaches during IT adoption in organisations (section 2.9.4). The assumption of the critical systems thinking component is that IT adoption problem contexts may be too complex to understand, let alone solve using one systems approach. The critical systems thinking component of the framework will address problem situations of a complex diverse nature.

In summary the framework suggests that a single systems approach does not fit all problem situations during IT adoption, highlighting the need for a multidisciplinary approach to complex problem situations. The framework advocates for the need to understand the problem context before selecting intervention strategies. The framework addresses the shortcomings of existing frameworks during IT adoption in organisations. The framework caters for different problem contexts during IT adoption in organisations. The framework therefore may have a potential to improve IT adoption outcomes in organisations, which is currently a major challenge. The framework may assist in leading to positive outcomes during IT adoption in organisations by mediating stakeholder participation and hard systems thinking components.

#### **7.4 Final validation interviews**

After refining the final framework using integrated results from quantitative and qualitative phases, final interviews were conducted with six participants from the previous sample (see Table 61). The purpose of the final qualitative interviews was to obtain the opinions and views of the participants on the final framework. The questions used for the interviews were in line with the outcomes of the final framework from the integrated results. The questions helped to get the users' perception on the validity of the final refined IT adoption governance framework.

##### **7.4.1 TAM Component**

The participants who were interviewed were asked about their opinions on the TAM component of the framework. They highlighted that that user experience and usefulness were important for during IT adoption in organisation. However the participants also noted that usability and usefulness were contextual to an individual user. The participants noted that usability depended on individuals and the type of system to be adopted. This is encapsulated in the following excerpts.

**Participant 3 (Finance Manager):** *“What is easy for IT staff may not be easy for normal users, so it difficult to know what is easy and who?”*

**Participant 1 (Accounts Clerk):** *“Usefulness is contextual from the point of view of an organisation with many business units. A system that is useful to one department may not be useful to another. In our organisation management implemented clocking systems and employees are not using it”.*

The participant also highlighted that usefulness depends on many factors such as efficiency, effectiveness and security of the system. This confirms that individuals have different worldviews about usability and usefulness of a system. This makes TAM not important from an organisation context during IT adoption.

#### **7.4.2 IT Governance Component**

The interviewed participants were asked about their opinions on the IT governance component of the framework. The participants highlighted that it is important to align business and IT objectives in the organisations. The participants noted that IT adoption needs to consider the business requirement and benefits. The business requirements and benefits can only be known if business units are involved. The interviewed participants noted that the IT committees are important during IT adoption as they help stakeholders to share their worldviews. IT committees can also help business and IT to speak the same language with regards to requirements and benefits of IT adoption in organisations.

#### **7.4.3 Stakeholder Participation Component**

The participants were asked about their opinions on the IT governance component of the framework. They highlighted that involvement and consultation of stakeholders were important during IT adoption in organisations. They noted that consultation of stakeholders, gives them an opportunity to voice their concerns during IT adoption in organisations was important. The interviewed participants noted that stakeholders may have different worldviews with regard to the benefits of IT adoption in organisations. The participants highlighted that in situations where departments have different worldviews, debates are important to reach consensus. These sentiments are reflected in the excerpts which follow.

**Participant 2 (IT Manager)** *“To me it is important for the warehouse system show me when stock is going to expire. These help me not to sell stock that will be returned by the customer. Accounts department do not see this as important to them at all. The current system does not show us when the stock is going to expire.”*

#### **7.4.4 Sociological Paradigm Component**

The interviewees were asked about their opinions on the sociological paradigm component of the framework. They agreed that it was important to understand the context of IT adoption in organisations before an intervention strategy. The sociological paradigm provides guidelines for selecting a systems approach for an intervention strategy during IT adoption strategy. The onus is on decision makers to select an appropriate systems approach for the problem context at hand. The sociological paradigm is therefore an important component of the framework.

#### **7.4.5 Hard Systems Thinking Component**

The participants were asked about their opinions on the hard systems thinking component of the framework. They highlighted that they expected IT adoption to improve efficiency and effectiveness in the organisation. The participants said they expected their work processes to change for the better after IT adoption in the organisation. It is therefore important for users to see benefits in their work after IT adoption although at times it is difficult to quantify them.

#### **7.4.6 Soft Systems Thinking Component**

The interviewees were also asked about their opinions on the soft systems thinking component of the framework. They supported the importance of soft systems thinking components during IT adoption in organisations. The participants highlighted that soft systems thinking was important to reach consensus and accommodate each other's worldviews during IT adoption in organisations. They noted that IT adoption benefits were subjective which justified the need for debate to reach consensus.

#### **7.4.7 Emancipatory Systems Thinking**

The interviewed participants were also asked about their opinions on the emancipatory systems thinking component of the framework. They agreed that emancipatory systems thinking were important in addressing issues of conflict, power relations, inequality, unfairness and coercion during IT adoption in organisations. The emancipatory systems thinking component of the framework therefore helps to democratize the IT adoption process in the organisation as shown in the following quotes.

**Participant 1 (Accounts Clerk)** *“Unfairness exist becomes some departments get more resources than others”.*

**Participant 3 (Finance Manager):** *“At times users are just forced to accept the new system without questions”.*



#### **7.4.8 Critical Systems Thinking**

The interviewed participants were asked about their opinions on the critical systems thinking component of the framework. They agreed that the critical systems thinking component was important in addressing issues of diversity, legitimacy and ethics during IT adoption in organisations. They highlighted that the affected and beneficiaries of IT adoption in the organisation needed to be identified and involved. The critical systems thinking component helps in addressing issues of ethics, legitimacy and diversity during IT adoption in organisations.

As a conclusion, the interviewed participants were in agreement with the framework components which are the final validation. Therefore the final framework, Figure 7.1, is a result of the preliminary framework, Chapter 3; the quantitative validation, Chapter 5; the qualitative validation, Chapter 6; the integrated validation, Chapter 7 and the final qualitative validation. The final validated framework is the major contribution of this research.

### **7.5 Conclusion**

This chapter presented the integrated results of the quantitative and qualitative phase from the sequential explanatory mixed methods research. The integrated results were important in refining the developed IT adoption governance framework developed in Chapter 3 of the study. The integrated results from the sequential explanatory mixed methods research suggest that stakeholder participation and hard systems thinking components are strong predictors of the IT governance component of the proposed IT adoption governance framework. The results suggest that in order to improve IT governance in organisations, it may be necessary to improve stakeholder participation and hard systems thinking components, which have strong and significant predictive powers on the IT governance component of the framework.

However the results also suggest that the two predictive constructs have strong association with other constructs except the TAM construct (see Figure 5.10). This implies that improvement on the other constructs have a positive effect on the predictive constructs (stakeholder participation and hard systems thinking components) of the proposed IT adoption governance framework. The refined IT adoption governance framework is presented after validation using the sequential explanatory mixed methods research (see Figure 7.1).

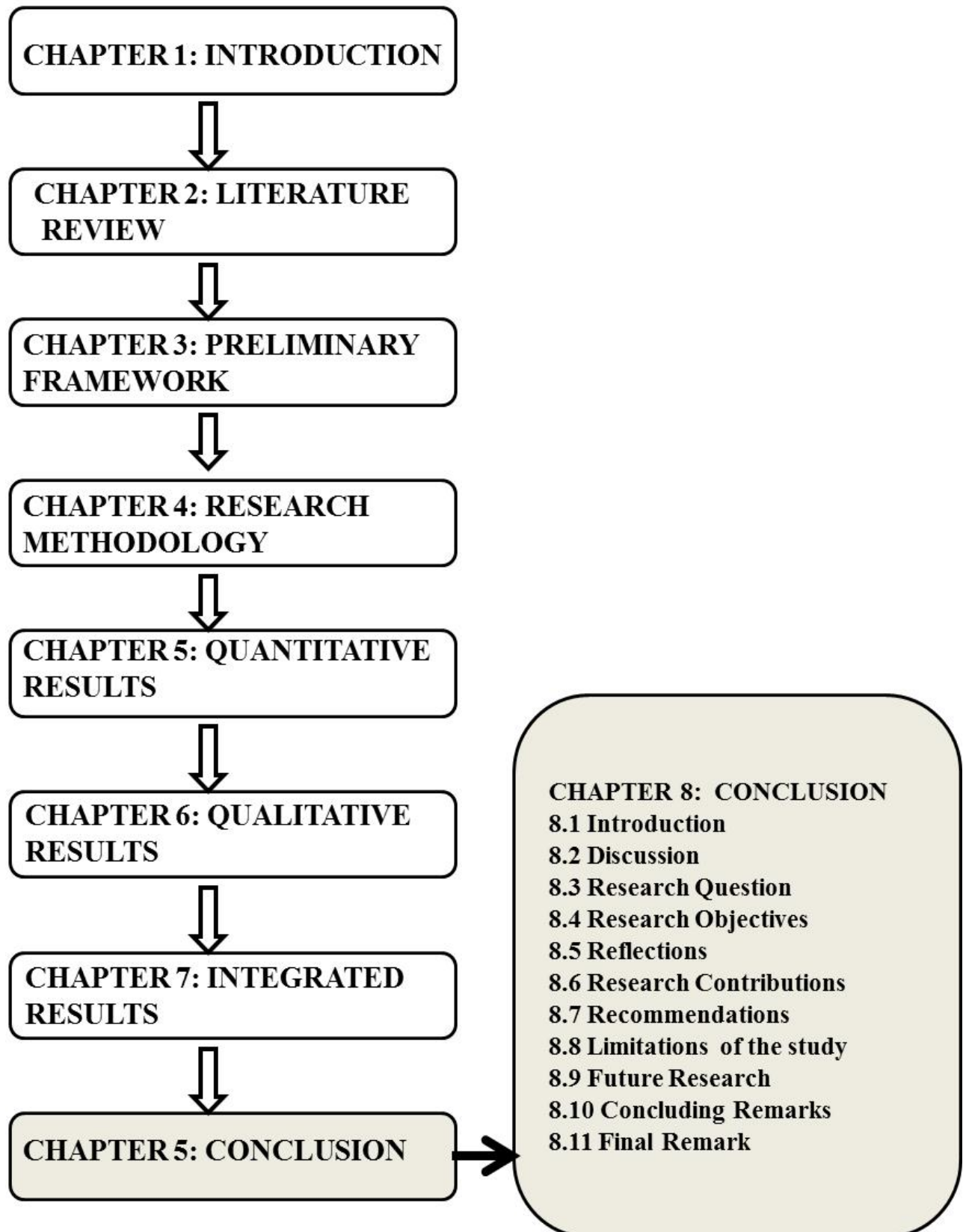
The integrated results therefore focused on what the participants said and also on why they said it. The integrated results helped to give a deeper holistic insight on participants'

perceptions of IT adoption decision making from what participants said from the quantitative phase and why they say so from the qualitative phase. The mixed methods research was therefore important to validate the IT adoption governance framework in the two organisations.

Whereas other studies have largely discounted challenges of marginalization and coercion in IT adoption, this study noted that these are important issues during IT adoption in organisations. The integrated results underscore the importance of addressing coercion and marginalization issues during IT adoption in organisations. On their own, the quantitative results do not tell the full story of IT adoption governance challenges in organisations. The quantitative results did not tell why there were differences in perceptions among participants with different demographic characteristics. The power of the mixed methods research approach was therefore to build a holistic picture on challenges of IT adoption decision making in organisations.

The results highlighted that IT adoption in organisations is a complex phenomenon which requires a multidisciplinary approach to understand. In addition, the results suggest that there is no one-size-fits-all approach to IT adoption decision making in organisations as contexts are always different. The framework therefore provides a guideline of how organisations can address the complexity of IT adoption in organisations using different paradigms. Having presented the integrated results, the next section presents the study conclusions.

## CHAPTER 8: DIAGRAMMATIC OVERVIEW



## **CHAPTER 8: CONCLUSION**

### **8.1 Introduction**

The objectives of this study were to develop and validate an improved IT adoption governance framework to assist organisations with IT adoption decision making. To achieve these objectives the study has to answer main research question and sub-questions. The literature review, Chapter 2, was useful to understand the shortcomings of current models and frameworks in IT adoption decision making in organisations. In addition the literature review contributed in giving some insight on how IT adoption decision making in organisations can be improved as a guide to proposing an IT adoption governance framework in Chapter 3. The literature review was important in informing the development of the improved IT adoption governance framework.

Chapter 4 presented and discussed the research methodology used to validate the proposed IT adoption governance framework. Chapter 4 discussed the justification and suitability of the research methodology to the research problem. Chapter 5 of the study presented and discussed the quantitative results of the first phase of validating the proposed framework. Chapter 6 presented and discussed the qualitative results of the second phase of validating the proposed framework. Chapter 7 of the study presented and discussed the integrated results of the quantitative and qualitative results of the study. Finally this last chapter discusses how the study achieved its objectives, answered the research question, study contributions to the body of knowledge, its limitations and areas of further study.

### **8.2 Discussion**

This study developed and validated an improved IT adoption governance framework, which is this thesis's major contribution to assist organisations with IT adoption decision making. The IT adoption governance framework was developed after an extensive literature review on current models and frameworks of technology adoption. As part of developing the framework, strengths and weaknesses of current frameworks were highlighted. The developed IT adoption governance framework was an integration of various models and frameworks as discussed in Chapter 3. The preliminary IT adoption governance framework was later validated in two organisations using a case study sequential explanatory mixed

methods research approach.

The study revealed that the properties of a framework to facilitate IT adoption in organisations have to be holistic in nature to address the complex nature of IT adoption decision making. The study therefore argues the case that IT adoption decision making is a complex endeavour which may require a multi-disciplinary approach. While traditional approaches based on a simplistic lens of reductionism were successful in addressing simpler functionalist problem situations, they are not suitable for addressing highly complex problem situations associated with IT adoption decision making in organisations. The study showed that a single approach does not fit all problem situations, highlighting the need for a multi-approach to complex IT adoption problem context. The diversity of systems approaches therefore should not be seen as a crisis, but a realization that different problem contexts require different approaches.

The developed IT adoption governance framework will help enhance a deeper understanding of IT adoption contexts before taking adoption decisions in organisations. The study acknowledges that in order for organisations to benefit from IT adoption, it is important to involve stakeholders with different worldviews during IT adoption. The study suggests the need for understanding the nature of the IT adoption problem context before making decisions on technology adoption in organisations. The study results indicate that sociological paradigms are important in understanding IT adoption problem contexts in organisations. The study concedes that the IT adoption problem context needs to be viewed from different sociological paradigms in order to understand the organisational context. Managers are therefore advised that the one-size-fits-all approach is not applicable to IT adoption decision making.

The developed IT adoption governance framework challenges organisations to understand the problem context in order to find a set of suitable approaches before an intervention strategy. The four sub-components of the sociological paradigm provide guidelines for selecting the appropriate set of approaches for the problem situation at hand. The different systems approaches are suitable for different problem contexts of IT adoption in organisations. The developed framework advocates the involvement of stakeholders during IT adoption in organisations. In addition, the framework advocates that the most suitable approach is used

for the problem situation at hand. The framework also allows for an iterative process to take place whereby approaches are tested on one problem situation.

Hard systems thinking approaches may not be suitable for problem contexts with no clear objectives to the benefits of IT adoption in organisations. Whilst soft systems thinking approaches are suitable for problem contexts where stakeholders have a divergence of worldviews, it has been found unsuitable to address coercive and conflicting problem context environments. Therefore problem contexts which are of a coercive nature may require emancipatory systems thinking approaches that are suitable for emancipating the oppressed stakeholders. In some cases the problem context may be so complex as to require the intervention to use more than one approach. Critical systems thinking approaches support the use of more than one approach as a way of complementing each other's weaknesses. In order to select the appropriate systems approaches it is, therefore, important to understand the IT adoption problem context. The next section addresses to what extent the study answered the research questions.

### **8.3 To what extent did the study answer the main research question?**

In order to understand the extent to which the study answered the main research question we need to first understand how it answered the sub-questions which make up the main research question. This section therefore discusses how the study answered the research sub-questions before answering the main research question. The first research sub-question was:

- **What are the needs of a framework to assist organisations during of information technology adoption?**

Chapter 2 highlighted the challenges of IT adoption in organisations, which was important for understanding the needs of a framework to assist organisations. The literature was of the opinion that there is no one-size-fits-all approach to IT adoption in organisations. The framework for IT adoption in organisations has to be holistic to be able to address different problem contexts. The complexity of IT adoption was influential in developing the framework. The second research sub-question was:

- **What are the possible shortcomings of existing frameworks for assisting organisations with IT adoption?**

Chapter 2 of the study helped to highlight some of the shortcomings of current models and frameworks to IT adoption decision making in organisations. Chapter 2, the literature review,

noted that IT adoption decision making is too complex to be understood using a cause and effect relationship since there are many variables that affect IT adoption in organisations. The point was also supported by quantitative results in Chapter 5 which showed associations between the IT adoption governance framework components. In addition, Chapter 2 highlighted that the worldviews of different stakeholders' presented challenges during IT adoption in organisations. The results were confirmed by t-tests (see section 5.3) and analysis of variance (ANOVA) results (see section 5.4) which indicated that demographic variables have an influence on the IT adoption governance framework.

The third research sub-question was:

- **How can IT adoption frameworks be improved in order to assist organisations with IT adoption governance?**

The third question was answered by Chapter 3 of the study which proposed an improved IT adoption governance framework to assist organisations with IT adoption decision making. The preliminary IT adoption governance framework was developed by integrating current frameworks in order to address their shortcomings. The validation results suggest that the framework constructs complement each other as indicated by quantitative results (section 5.5 – 5.6). The fourth research sub-question was:

- **To what extent could the new framework facilitate IT adoption governance in organisations?**

The developed framework facilitates IT adoption governance in organisations as it offers a holistic approach to complex IT adoption problem situations. The various component of the framework facilitate different IT adoption problem context in organisations (see section 7.3). The ability to address different IT adoption problem contexts is the major contribution of the developed framework in assisting IT adoption governance during IT adoption in organisations.

**To answer the main question:**

- **How can information technology adoption in organisations be facilitated?**

Information technology adoption in organisations can be facilitated using a framework based on a holistic approach in order to be able to handle different problem contexts during IT adoption in organisations. Since there is no one-size-fits-all solution to IT adoption in organisations, a holistic approach will provide a guideline to the most appropriate approach to

the problem context. The next section addresses to what extent the study met its aims and objectives.

#### **8.4 To what extent did the study meet its aim and objectives?**

The overarching aim of this study was to develop an IT adoption governance framework to assist organisations with IT adoption decision making. To a large extent those objectives were achieved as Chapter 3 developed the proposed framework based on an extensive literature review. In addition, the IT adoption governance framework which was developed in this study was validated using a case study sequential explanatory mixed methods research. The integrated results from the quantitative and qualitative phase were used to refine the IT adoption governance framework. The main objectives of this study were:

- **To determine the needs of an organisation during information technology adoption**

The study met this objective through exploring the literature review in Chapter 2; the quantitative results from questionnaires sent to participants in Chapter 5, and the qualitative results from interviews with participants in Chapter 6. The literature review helped identify strengths and weaknesses of existing frameworks. The quantitative results helped to obtain what the participants say about their needs during IT adoption in organisations. The qualitative interviews answered some ‘why’ questions from the quantitative phase. The mixed methods research was therefore important in obtaining a holistic understanding of the needs of an organisation during IT adoption.

- **To explore and evaluate existing frameworks for assisting organisations with IIT adoption decision making**

This study met this objective in that it explored and evaluated existing frameworks as part of the Chapter 2 the literature review. The evaluation was part of understanding the strengths and weaknesses of existing frameworks in assisting organisations during IT adoption.

- **To develop an improved IT adoption governance framework to assist organisations in IT adoption decision making**

The study met this objective in that it developed a preliminary framework in Chapter 3, based on the extensive literature review from Chapter 2. The preliminary framework was developed from a combination of existing frameworks. The combination of existing frameworks meant that they can complement each other’s weaknesses.



- **To validate and refine the developed IT adoption governance framework in organisations**

The study met this objective in that the developed framework in Chapter 3 was validated using a mixed methods research. Chapter 5 performed the first quantitative validation of the framework. The quantitative results, in addition to validation, provided input to the second qualitative interview validation presented in Chapter 6. While the quantitative results helped to answer the “what” questions of validation, the qualitative results helped to answer the “why” questions during the validation of the developed framework. The last validation of the framework was done after the integration of quantitative and qualitative results as part of refining the framework, shown in Figure 7.1. The final validation was important in developing the final framework. The next section discusses reflections on the study in terms of challenges.

### **8.5 Reflections**

Many researchers highlighted challenges of getting permission and accessing organisations for collecting data for a research study. Although six organisations had initially accepted to participate in the study, four of the organisations declined during the data collection phase. The most cited reason was that the organisations were busy. This supports literature that it is not easy to get access to organisations to conduct research. The number of organisations that participated in this study was therefore limited to two. The other challenge was also that it took time to get questionnaires back from participants. However, the interview phase went well with participants showing some enthusiasm and being very cooperative during the sessions. The next section discusses the study’s contribution to the body of knowledge.

### **8.6 Research Contributions**

The study contributes to the current body of knowledge on IT adoption decision making in many ways. This study helped expand theory on IT adoption decision making from a multiple stakeholder perspectives in organisations. With a few undertaking research on IT adoption decision making from an organisation perspective, this study therefore contributes to the body of knowledge by addressing the knowledge gap in an important research area. In addition, the study made contributions through three presentations at international conferences and publications in three peer reviewed conference proceedings.

From a practical contribution perspective, the study made a major contribution by developing a framework to assist organisations to improve IT adoption decision outcomes. The potential

benefit of the framework is that, it allows decision makers to view IT adoption problem contexts from multiple perspectives rather than taking for granted certain assumptions during IT adoption decision making in organisations. The ability of the framework to use more than one approach to a single problem context is a major advantage of the framework as problem situations in organisations do not present themselves dichotomously. The results suggest that the study contributes to both theory and practice in IT adoption decision making in organisations. The next section presents some recommendations based on the results from the study.

### **8.7 Recommendations**

Several recommendations can be made from the study results.

- i. The study recommends involvement and consultation of stakeholders during IT adoption decision making in organisations to secure their buy-in. The study also recommends the representation of different stakeholders during IT adoption decision making in organisations. This can be achieved through IT committees with members representing various departments in the organisations.
- ii. The study recommends the use of sociological paradigms to understand the IT adoption problem contexts and help select an appropriate systems approach to address the problem situation. The sociological paradigm component is important in selecting the suitable systems approach to the problem situation at hand in organisations.
- iii. The study recommends the use of hard systems thinking approaches in IT adoption problem contexts where stakeholders have agreed objectives. Hard systems thinking approaches are most appropriate in addressing cause and effect relationship problem situations during IT adoption in organisations.
- iv. The study recommends the use of soft systems thinking approaches in IT adoption problem contexts with subjective unclear objectives, in order to reach consensus. The soft systems thinking approaches help to reach consensus and accommodate different worldviews during IT adoption in organisations.
- v. The study recommends the use of emancipatory systems thinking approaches in coercive, oppressive and discriminatory IT adoption problem contexts. The emancipatory systems thinking approaches help to empower stakeholders and achieve democratic IT adoption decision making in organisations.
- vi. The study recommends the use of critical systems thinking approaches in more diverse complex IT adoption problem contexts. The critical systems thinking approaches allow

the use of more than one systems approach to a single problem situation. The critical systems thinking assumption is that a single systems approach may not be adequate in complex IT adoption problem situations

Finally, the study results point to the fact that there is no one-size-fits-all approach to IT adoption decision making in organisations as contexts always differ. It is therefore important for organisations to understand the problem context before selecting an appropriate intervention strategy. This is where the IT adoption governance framework becomes important in selecting the suitable systems approach to the problem situation at hand. The next section discusses the limitations of this study.

### **8.8 Limitation of the study**

Although the study contributed to the understanding of IT adoption decision making in organisations it has its limitations which need to be acknowledged. One of the major limitations of the study is that it is based on case study research which makes it difficult to generalize the results of the study. The limitation provides an opportunity for further research using a survey. In addition the other limitation was that the framework was not tested during IT adoption but only validated using participants' perceptions based on previous IT adoption experience in their organisations. A longitudinal action research study may also be necessary to test the framework during IT adoption in organisations. However, despite these limitations of the study, the use of mixed methods research helped to produce credible results not affordable with a single research method. The next section discuss opportunities for future research in IT adoption decision making.

### **8.9 Future Research**

The fact that the study was based on a case study meant that it had limitations which can be addressed by another study based on a survey which can allow the results to be generalized to a large population. In addition, testing the framework during IT adoption in an organisation may show if the framework can improve the outcome of IT adoption in organisations. Research based on a longitudinal study may also prove to be important to allow comparisons of results from different interventions during IT adoption in organisations. In addition, there is a possibility to employ other sophisticated statistical methods such as structural equation modeling. This study therefore provides avenues for several areas of further research on this under- explored topic of IT adoption decision making in organisations.

### **8.10 Concluding Remarks**

This section presents the main contributions of this study to the theory and practice of IT adoption decision making in organisations. The study contributes to the understanding of the complexity of IT adoption decision making in organisations. Of particular importance is the influence of demographic characteristics on stakeholder perception on IT adoption decision making in organisations. The study therefore confirms the importance of understanding different stakeholder worldviews during IT adoption decision making in organisations. The study expands our knowledge on the complexity and importance of reaching consensus during IT adoption decision making in organisations. The study also highlights the significance of the need for an interdisciplinary approach during IT adoption in order to understand problem contexts from different perspectives. Although there have been several studies on IT adoption, not much research has been done on IT adoption decision making in organisations. Several studies have been focused on individual technology adoption with no attention to technology adoption from an organisation perspective where many stakeholders are involved.

Many studies overlook the importance of IT adoption decision making in organisations, which is complex owing to different stakeholder worldviews. This study reveals the shortcomings of current models and frameworks relating to the complex phenomenon of IT adoption decision making in organisations. This study therefore provides a deeper understanding of the challenges of IT adoption decision making in organisations. Furthermore, the study also developed an improved IT adoption governance framework to assist organisations with IT adoption decision making. The developed IT adoption governance framework has the potential to improve IT adoption decision making in organisations. The developed framework based on holistic systems approaches helps to view IT adoption problem contexts from different perspectives in order to find suitable systems approaches to address the IT adoption problem in organisations. The developed IT adoption governance framework is expected to improve stakeholder perceptions and IT adoption outcomes in organisations.

The study reveals that stakeholder participation and hard systems thinking have significantly positive effects on IT governance perceptions in the two organisations. Other than protecting interests of various interested parties, stakeholder participation has a positive contribution to IT adoption in organisations as it helps to get their buy-in. Organisations can therefore

enhance the chances of IT adoption success by encouraging stakeholder participation since it is a strong predictor of IT governance. In addition, stakeholder participation to IT adoption helps to bridge the different perceptions of the benefits of IT adoption in organisations. Promoting stakeholder participation during IT adoption in organisations is therefore important to get buy-in and reduces resistance.

### **8.11 Final Remark**

The properties of a framework to facilitate information technology adoption in organisations have to be holistic in nature to address the complex nature of IT adoption decision making in organisations. There is no one-size-fits-all approach to IT adoption decision making in organisations which may require an inter-disciplinary approach.

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## APPENDIX A: QUESTIONNAIRE

### DEVELOPING A FRAMEWORK TO ASSIST ORGANISATIONS WITH INFORMATION TECHNOLOGY ADOPTION GOVERNANCE

Dear Respondent

This survey forms part of a doctoral thesis entitled: Developing a framework to assist organisations with information technology adoption governance at the University of South Africa.

The aim of this study is to develop a framework to assist with IT adoption governance in organisations. You are kindly requested to complete this survey questionnaire, comprising of ten sections as honestly and frankly as possible and according to your personal views and experience. You have the right **not to complete all questions if so** desired. You are not required to indicate your name but your age, gender, occupation position etc. will contribute to a more comprehensive analysis. All information obtained from this questionnaire will be used for research purposes only.

After completion of the thesis, a summary of the findings of the research will be available to respondents on request. Any enquiries may be made to Mr Jokonya, email: [jokonyao@hotmail.com](mailto:jokonyao@hotmail.com).

Thank you for your cooperation.

Mr Osden Jokonya

## DEVELOPING A FRAMEWORK TO ASSIST ORGANISATIONS WITH INFORMATION TECHNOLOGY ADOPTION GOVERNANCE

### Instructions:

Please mark your choice with an “X” in the relevant field and select only one option unless otherwise indicated.

The questionnaire consists of seven sections.

Section A: Biographical Data

Section B: TAM Model

Section C: IT Governance

Section D: Stakeholders participation

Section E: Sociological Paradigm

Section F: Hard Systems Thinking

Section G: Soft Systems Thinking

Section H: Emancipatory Systems Thinking

Section I: Critical Systems Thinking

Section J: Further Comments

### Section A: Biographical Data

Office use only

Date: \_\_\_\_/\_\_\_\_/2013

Serial no

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3

#### 1. Age category

1	20—30 years	
2	31—40 years	
3	41—50 years	
4	51—60 years	
5	Above 60 years	

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4

#### 2. Gender

1	Male	
2	Female	

--

5

#### 3. Department

1	Finance	
2	Production	
3	Distribution	
4	Human Resources	
5	Information Technology	
6	Other	

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<p><b>4. What is your position?</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">1</td> <td style="width: 60%;">Clerical</td> <td style="width: 30%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Supervisor</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Manager</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Other</td> <td></td> </tr> </table>	1	Clerical		2	Supervisor		3	Manager		4	Other		<div style="border: 1px solid black; width: 100px; height: 30px; margin: 0 auto;"></div> <p>7</p>			
1	Clerical															
2	Supervisor															
3	Manager															
4	Other															
<p><b>5. Level of education (please indicate your highest qualification only)</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">1</td> <td style="width: 60%;">Primary</td> <td style="width: 30%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Matric</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Bachelor's degree or equivalent</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Post Graduate</td> <td></td> </tr> </table>	1	Primary		2	Matric		3	Bachelor's degree or equivalent		4	Post Graduate		<div style="border: 1px solid black; width: 100px; height: 30px; margin: 0 auto;"></div> <p>8</p>			
1	Primary															
2	Matric															
3	Bachelor's degree or equivalent															
4	Post Graduate															
<p><b>6. Have you been involved in IT adoption in this organisation?</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">1</td> <td style="width: 60%;">Yes</td> <td style="width: 30%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>No</td> <td></td> </tr> </table>	1	Yes		2	No		<div style="border: 1px solid black; width: 100px; height: 30px; margin: 0 auto;"></div> <p>9</p>									
1	Yes															
2	No															
<p><b>7. Number of years working for the company?</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">1</td> <td style="width: 60%;">2 years or less</td> <td style="width: 30%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>3-5 years</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>6-10 years</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>10 years+</td> <td></td> </tr> </table>	1	2 years or less		2	3-5 years		3	6-10 years		4	10 years+		<div style="border: 1px solid black; width: 100px; height: 30px; margin: 0 auto;"></div> <p>10</p>			
1	2 years or less															
2	3-5 years															
3	6-10 years															
4	10 years+															
<p><b>8. Are you engaged in any of the following (please check as many of the options that apply):</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">1</td> <td style="width: 60%;">IT committee</td> <td style="width: 30%;"></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Project Committee</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Strategy Committee</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Other Committee</td> <td></td> </tr> <tr> <td style="text-align: center;">5</td> <td>None</td> <td></td> </tr> </table>	1	IT committee		2	Project Committee		3	Strategy Committee		4	Other Committee		5	None		<div style="border: 1px solid black; padding: 5px;"> <p>This format makes provision for capturing more than one response</p> <div style="border: 1px solid black; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; height: 20px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; height: 20px;"></div> </div>
1	IT committee															
2	Project Committee															
3	Strategy Committee															
4	Other Committee															
5	None															

Section B: TAM Model						
Please indicate your extent of agreement with each of the following statements by ticking the appropriate box.						
Use the following five-point scale in Section B:						
Legend:						
1: Strongly disagree		2: Disagree		3: Neutral		
4: Agree		5: Strongly agree				
ITEMS	1	2	3	4	5	
1. Do you thinking availability is an important factor on IT adoption decision making in an organisation?						<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto;"></div>
2. Do you thinking usability is an important factor on IT adoption decision making in an organisation?						
3. Do you thinking reliability is an important factor on IT adoption decision making in an organisation?						
4. Do you thinking security is an important factor on IT adoption decision making in an organisation?						
5. Do you thinking usefulness is an important factor on IT adoption decision making in the organisation?						
6. Do you thinking cost savings is an important factor on IT adoption decision making in an organisation?						
7. Do you think functionality is an important factor IT adoption decision making in an organisation?						
8. Do you thinking response time is an important factor on IT adoption decision making in an organisation?						
9. Do you thinking flexibility is an important factor on IT adoption decision making in an organisation?						
10. Do you thinking adaptability is an important factor on IT adoption decision making in an organisation?						

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Section C: IT Governance	

Please answer each item by ticking off “X” the relevant option. Use the following five-point scale in Section C: Legend: 1: Strongly disagree                      2: Disagree                      3: Neutral 4: Agree                      5: Strongly agree						<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto;"></div>
ITEMS	1	2	3	4	5	
1. Do you think IT adoption decision making process in an organisation is always transparent?						
2. Do you think there is always an alignment of business and IT adoption objectives in an organisation?						
3. Do you think IT adoption objectives are always were to stakeholders in an organisation?						
4. Do you think there is always shared responsibility in IT adoption decision making in an organisation?						
5. Do you think the desired outcomes of IT adoption are always clear in an organisation?						
6. Do you think IT adoption benefits are always clear to stakeholders in an organisation?						
7. Do you think clear objectives are important in IT adoption in an organisation?						
8. Do you think there are always agreement on IT adoption objectives in an organisation?						
9. Do you think IT adoption objectives are always achieved in an organisation?						
10. Do you think stakeholders’ participation is important in IT adoption decision making in an organisation?						

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<b>Section D: Stakeholders Participation</b> Please answer each item by ticking off the “X” for the relevant option. Use the following five-point scale in Section D: 1: Strongly disagree                      2: Disagree                      3: Neutral 4: Agree                      5: Strongly agree						<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto;"></div>
ITEMS	1	2	3	4	5	
1. Do you think it is important to consult stakeholders on IT adoption decision making in an organisation?						
2. Do you think IT adoption decision in an						



organisation should be based on stakeholder perspectives?								
3. Do you think stakeholder perspectives are important in IT adoption decision making in an organisation?								
4. Do you think stakeholders always agree on IT adoption benefits in an organisation?								
5. Do you think stakeholder participation contribute to IT adoption success in an organisation?								
6. Do you think stakeholders' consensus is important in IT adoption in an organisation?								
7. Do you think there was consensus on IT an adoption objective in organisation?								
8. Do you think the affected stakeholders need to be involved in IT adoption decision making in an organisation?								
9. Do you think IT adoption objectives always agree with stakeholders' objectives in an organisation?								
10. Do you think stakeholders always appreciate IT adoption benefits in an organisation								

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<b>Section E: Sociological Paradigm</b> Please answer each item by ticking off the "X" for the relevant option. Use the following five-point scale in Section E: 1: Strongly disagree      2: Disagree      3: Neutral 4: Agree      5: Strongly agree						
ITEMS	1	2	3	4	5	
1. Do you think social issues are important in IT adoption in an organisation?						
2. Do you think addressing social is issues important for IT adoption success in an organisation?						
3. Do you think social issues can impact IT adoption in an organisation?						
4. Do you think is important for stakeholders to discuss IT adoption issues in an organisation?						
5. Do you think social issues need to be debated during IT adoption in an organisation?						
6. Do you think stakeholders need IT knowledge to participate in IT adoption decision making						

in an organisation?							
7. Do you think stakeholders can contribute to IT adoption decision making in an organisation?							
8. Do you think stakeholder concerns must be addressed before IT adoption in an organisation?							
9. Do you think IT adoption benefits are always the same for all stakeholders in an organisation?							
10. Do you think stakeholders need an awareness of IT adoption benefits in an organisation?							

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<b>Section F: Hard Systems Thinking</b> Please answer each item by ticking off the “X” for the relevant option. Use the following five-point scale in Section F: 1: Strongly disagree      2: Disagree      3: Neutral 4: Agree      5: Strongly agree							
ITEMS	1	2	3	4	5		
1. Do you think IT adoption benefits in an organisation can be quantified?							
2. Do you think IT adoption success in an organisation can be measured successful?							
3. Do you think of IT adoption success in an organisation can be guaranteed?							
4. Do you think the measure of IT adoption success must always be clear in an organisation?							
5. Do you think IT adoption outcomes can be predictable in an organisation?							
6. Do you think IT adoption benefits in an organisation can predictable?							
7. Do you think unit of purpose always exist in IT adoption in an organisation?							
8. Do you think IT adoption may improve efficiency in an organisation?							
9. Do you think IT adoption benefits are always tangible in an organisation?							
10. Do you think IT adoption may improve effectiveness in an organisation?							

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Section G: Soft Systems Thinking						
Please answer each item by ticking off the “X” for the relevant option.						
Use the following five-point scale in Section G:						
1: Strongly disagree		2: Disagree		3: Neutral		
4: Agree		5: Strongly agree				
ITEMS	1	2	3	4	5	
1. Do you think consensus in IT adoption objectives is important in an organisation?						
2. Do you think stakeholders must debate IT adoption objectives in an organisation?						
3. Do you think stakeholders need to be involved IT adoption decision making in an organisation?						
4. Do you think stakeholder perceptions need to be accommodated in IT adoption in an organisation?						
5. Do you think different stakeholder views are important in IT adoption decision making in an organisation?						
6. Do you think soft issues are important for the success of IT adoption in organisation?						
7. Do you think political issues are important for the success of IT adoption in an organisation?						
8. Do you think stakeholder attitudes can be changed during IT adoption in an organisation?						
9. Do you think different stakeholder views need to be incorporated in IT adoption decision making?						
10. Do you think it is important to seek stakeholder agreement in IT adoption objectives in an organisation?						


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Section H: Emancipatory Systems Thinking						
Please answer each item by ticking off the “X” for the relevant option.						
Use the following five-point scale in Section H:						
1: Strongly disagree		2: Disagree		3: Neutral		
4: Agree		5: Strongly agree				
ITEMS	1	2	3	4	5	
1. Do you think there is always fairness in IT						

adoption decision making in an organisation?							
2. Do you think there always stakeholder conflicts during IT adoption in an organisation?							
3. Do you think power relations may affect IT adoption decision making in an organisation?							
4. Do you think stakeholder inequalities may affect IT adoption decision making in an organisation?							
5. Do you think stakeholder coercive may affect IT adoption in an organisation?							
6. Do you think the nature of IT adoption improvement is important in an organisation?							
7. Do you think the affected stakeholder interests are important in IT adoption in an organisation?							
8. Do you think the affected stakeholder concerns must be addressed before IT adoption in an organisation?							
9. Do you think affected stakeholder representation is important during IT adoption in an organisation?							
10. Do you think stakeholder empowerment is important in IT adoption in an organisation?							

Section I: Critical Systems Thinking					
Please answer each item by ticking off the “X” for the relevant option.					
Use the following five-point scale in Section I:					
1: Strongly disagree		2: Disagree		3: Neutral	
4: Agree		5: Strongly agree			
ITEMS	1	2	3	4	5
1. Do you think stakeholder perception diversity is important in IT adoption in an organisation?					
2. Do you think addressing issues of oppression is important in IT adoption in an organisation?					
3. Do you think addressing political issues is important in IT adoption in an organisation?					
4. Do you think addressing social issues is important IT adoption in an organisation?					
5. Do you think addressing critical issues is important in IT adoption in an organisation?					

Please answer each item by ticking off the “X” for the relevant option.

Use the following five-point scale in Section I:

1: Strongly disagree

2: Disagree

### 3: Neutral

#### 4: Agree

5: Strongly agree

ITEMS	1	2	3	4	5
1. Do you think stakeholder perception diversity is important in IT adoption in an organisation?					
2. Do you think addressing issues of oppression is important in IT adoption in an organisation?					
3. Do you think addressing political issues is important in IT adoption in an organisation?					
4. Do you think addressing social issues is important IT adoption in an organisation?					
5. Do you think addressing critical issues is important in IT adoption in an organisation?					

6. Do you think addressing ethical issues is important in IT adoption in an organisation?								
7. Do you think identifying the affected stakeholders is important IT adoption in an organisation?								
8. Do you think emancipating stakeholder is important in IT adoption in an organisation?								
9. Do you think identifying the beneficiary stakeholders of IT adoption is important in an organisation?								
10. Do you think it is important for IT adoption benefits to be legitimate to all stakeholders in an organisation?								

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<b>Section J: Further Comments</b>	
Please add some comments (only those that you think to be important and relevant to the aims of this survey).	

**Thank you for completing this questionnaire!**

## APPENDIX B: INTERVIEW GUIDE

### Section A: Biographical Data

1. What is your position in the organisation?
2. How long have you been with the organisation?
3. What is your highest level of education?
4. What is your age?
5. What is your department?

### Section B: TAM Model

1. What were your perceptions about IT adoption in an organisation?
2. What were your responsibilities during IT adoption in your organisation?
3. What were your expected benefits of IT adoption in your organisation?
4. How were your expectations met by IT adoption in the organisation?
5. What were your major challenges during IT adoption in your organisation?
6. What were your experiences from IT adoption in your organisation?
7. How do you evaluate IT adoption success in an organisation?

### Section C: IT Governance

1. How can stakeholders reach agreement on IT adoption objectives in an organisation?
2. What is the importance of agreement on IT adoption objectives in organisation? How can IT adoption and organisational objectives aligned?
3. What do you think is the importance of aligning IT adoption to organisational objectives?
4. In your opinion what is the importance of clear IT adoption objectives to stakeholders in an organisation?
5. How do you think IT adoption objectives can be made clear to stakeholders?
6. In your opinion what is the importance of clear IT adoption benefits to stakeholders in an organisation?
7. How do you think IT adoption benefits can be made clear in an organisation??

### Section D: Stakeholders

1. What is your opinion with regard to stakeholders' involvement in IT adoption decision making in an organisation?
2. What are the benefits of stakeholder involvement in IT adoption in an organisation?
3. What is your opinion about stakeholders' different views on IT adoption in an organisation?
4. How do you think stakeholder different worldviews on IT adoption should be addressed in an organisation?
5. How can stakeholders reach consensus on IT adoption decision making in an organisation?
6. What is the importance of stakeholders' consensus on IT adoption in an organisation?

### Section E: Sociological Paradigm

1. What is your perception about social issues in IT adoption in an organisation?
2. What is the importance of social issues in IT adoption in an organisation?
3. How do you think IT adoption social issues can be addressed in an organisation?

<ol style="list-style-type: none"> <li>4. What is your opinion about expert knowledge in IT adoption in an organisation?</li> <li>5. What is the role of non-experts in IT adoption decision making in an organisation?</li> <li>6. What is the importance of stakeholder IT knowledge in IT adoption in an organisation?</li> <li>7. What is the importance of social context in IT adoption in an organisation?</li> <li>8. How can social context issues be addressed during IT adoption in an organisation?</li> </ol>
<p><b>Section F: Hard systems</b></p> <ol style="list-style-type: none"> <li>1. How can IT adoption objectives be clarified in an organisation?</li> <li>2. How can stakeholders achieve unity of purpose during IT adoption in an organisation?</li> <li>3. How can IT adoption success in an organisation be evaluated?</li> <li>4. What criteria can be used to evaluate the success of IT adoption in an organisation?</li> <li>5. How can the IT adoption improvements be measured in an organisation?</li> <li>6. How can IT adoption benefits be measured in an organisation?</li> <li>7. What criteria can be used to measure IT adoption benefits in an organisation?</li> <li>8. What are the challenges of predicting IT adoption outcomes in an organisation?</li> </ol>
<p><b>Section G: Soft Systems</b></p> <ol style="list-style-type: none"> <li>1. What are the challenges of stakeholders reaching consensus on IT adoption objectives in an organisation?</li> <li>2. What the challenges are of evaluate IT adoption improvements in an organisation?</li> <li>3. How can subjectivity be encouraged during IT adoption in an organisation?</li> <li>4. How can stakeholders' diverse interests be accommodated during IT adoption in an organisation?</li> <li>5. How can stakeholders be involved in IT adoption debate in an organisation?</li> <li>6. What is the importance of stakeholders' debates on IT adoption issues in an organisation?</li> <li>7. How can stakeholder participation be promoted during IT adoption in an organisation?</li> <li>8. How can stakeholder world views be changed during IT adoption in an organisation?</li> </ol>
<p><b>Section H: Emancipatory</b></p> <ol style="list-style-type: none"> <li>1. How can the beneficiaries of IT adoption be identified in an organisation?</li> <li>2. Which stakeholder worldviews should influence IT adoption decisions in an organisation?</li> <li>3. How are the marginalized and affected stakeholders represented during IT adoption in an organisation?</li> <li>4. How can fairness among stakeholders be achieved during IT adoption decision making in an organisation?</li> <li>5. How can stakeholder conflict of interest during IT adoption be resolved in an organisation?</li> <li>6. How can stakeholder power relations effects be minimized during IT adoption decision making in an organisation?</li> <li>7. How can stakeholder coercion be minimized during IT adoption in an</li> </ol>

organisation?

**Section I: Critical Systems Thinking**

1. What is the importance of stakeholders' diverse worldviews in IT adoption in an organisation?
2. How can the affected stakeholders be involved in IT adoption decision making in an organisation?
3. How can the marginalized individuals and groups have input during IT adoption in an organisation?
4. How can the marginalized stakeholder voices be heard during IT adoption in an organisation?
5. How can diversity of worldviews be promoted during IT adoption in an organisation?
6. How can the affected and not involved be identified during IT adoption decision making in an organisation?
7. How can the oppressed stakeholders be empowered and emancipated during IT adoption in an organisation?

**Section J: Conclusion**

What else can you tell me about IT adoption in your organisation that I did not ask you?

Can you give names of suitable people who else might be useful to interview for this study?

**Thank you for participating in the interview.**



## APPENDIX C: ORGANISATION CONSENT FORM

### RESEARCH STUDY PARTICIPANT CONSENT FORM

#### RESEARCH BACKGROUND

#### CONFIDENTIAL

##### RESEARCHER INFORMATION

**Name:** Mr. O. Jokonya  
**E-Mail:** [jokonyao@hotmail.com](mailto:jokonyao@hotmail.com)  
**Contact Number:** (+27) 073 3919863  
**Institution:** University of South Africa  
(UNISA)

##### SUPERVISOR INFORMATION

Prof. J. H. Kroeze  
[kroezjh@unisa.ac.za](mailto:kroezjh@unisa.ac.za)  
(+ 27) 012 429 6976  
University of South Africa  
(UNISA)

##### CO-SUPERVISOR

Prof. J. A. van der Poll  
[ydpolja@unisa.ac.za](mailto:ydpolja@unisa.ac.za)  
(+27) 012 429 6230  
University of South Africa (UNISA)

#### STUDY INFORMATION

Title of Research: A framework to assist organisations with Information Technology adoption governance.

##### Objectives:

- (a) To understand how organisations make decisions on IT adoption
- (b) To find out how stakeholders are identified during IT adoption in organisations
- (c) To understand how stakeholders are involved in IT adoption decision making
- (d) To find out how stakeholders conflicts on IT adoption are resolved in organisations
- (e) To develop and test an improved framework to assist with IT adoption decision making in organisations

**Nature:** The proposed IT adoption framework is expected to assist organisations in resolving problem situations from multiple perspectives.

**Implications:** The proposed framework provides mechanisms for addressing conflict of interest among stakeholders, which is rather common with IT adoption in organisations. Responses will be confidential and anonymous.

**Duration of Study:** Until August 2014 (Date of submission)

**Safety & Health Implications:** None

**Duration of Participation:** One Hour

## **PARTICIPANT RIGHTS**

The participants retain the right to decide to participate in the study. The participant's privacy or dignity will not be violated by using hidden cameras, one-way glass, microphones, sound recordings or any other research devices, without his/her permission. Microphones sound recordings or any other research devices may be used where the participant's permission is implied by his/her presence and where it cannot be used elsewhere to their disadvantage. All information will be handled confidentially. The participant's identity will not be revealed and any conclusions derived from the study will be considered anonymous. The results of the study may be used for purposes of publication. Subjects will be provided with a copy of the Participant Information Form, as well as have its contents explained to them, before they consent to participating in the study.

## **PARTICIPANT PERMISSION FORM**

### **Dear participant**

Thank you for showing interest to participate in this PhD research study, which has the objective of developing a framework to assist organisations with Information Technology adoption governance. The study is conducted by Osden Jokonya under the supervision of both Prof Jan Kroeze and Prof J. A. van der Poll from the University of South Africa. Your participation is completely voluntary and the results will be treated as both confidential and anonymous, and will only be used for research purposes. The duration of your participation is not expected to exceed one hour.

During this research, you will be asked to answer some questions relating to developing a framework to assist organisations with Information Technology adoption governance, the problems you encounter, how you solve them, and measures taken to prevent future occurrence of the problems encountered. This research uses the case study method. Data will be gathered through questionnaires and interviews. A number of semi-structured interviews will be conducted during the research. Each interview is designed to last for about an hour in length. The researcher is eager to learn from your practice. Feel free to expand on this subject or talk about related ideas that support your views. You are also free not to answer any questions you feel you cannot answer or that you do not feel comfortable answering. Feel free to indicate this when applicable and I will move on to the next question.

You will be assigned a code number which will protect your identity. All data will be kept in secured files, in accordance with the standards of the University of South Africa. All identifying information will be removed immediately after each interview is completed. Therefore, no one will be able to know your interview responses. Upon completion of this research project, all data will be destroyed, or stored in a secure location where it can be accessed by the researcher on a need basis.

## CONFIDENTIAL

### Participant's Agreement

You will be provided with a copy upon signature of this form. The participant also has the right to withdraw their participation at any time.

I,..... hereby voluntarily grant my permission for participation in the research project as explained to me by the researcher Osden Jokonya. The inputs derived from my participation will be interpreted and presented in a confidential nature and anonymous manner. The nature, objective, possible safety and health implications have been explained to me and I understand them. I understand my right to choose whether to participate in the project and that the information furnished will be handled confidentially and anonymously. I am aware that the results of the investigation may be used for the purposes of publication.

I understand the intent and purpose of this research. The researcher has reviewed the individual and social benefits and risks of this project with me. I am aware that data will be used for a dissertation, research paper, and a research presentation. I have the right to review, comment on, and/or withdraw information after giving the researcher reasonable time prior to submission of the research dissertation.

The data gathered in this study are confidential and anonymous with respect to my personal identity unless I specify/indicate otherwise. I grant permission for the use of this information for a:

Dissertation [ ]  
Research Paper [ ]

I grant the permission to use one of the following:

My first name only: \_\_\_\_\_

My Full name: \_\_\_\_\_

Just a pseudonym: \_\_\_\_\_

I will be given a copy of the:

Paper [ ]  
Audiotape [ ]  
Transcribed interview [ ]

Additional conditions for my participation in this research are noted here:

.....  
.....  
.....  
.....  
.....

I have read the above form and, with the understanding that I can withdraw at anytime, and for whatever reason, I consent to participate in this interview.

.....  
.....  
**Participant's signature**

**Date**

.....  
.....  
**Interviewer's signature**  
**Date**

## **APPENDIX D: REQUEST FOR PERMISSION LETTER**

### **LETTER TO REQUEST PERMISSION FROM GATE-KEEPERS OF PARTICIPATING ORGANISATIONS**

#### **RESEARCH BACKGROUND**

#### **CONFIDENTIAL**

##### **RESEARCHER**

Name: Mr. O. Jokonya

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##### **CO-SUPERVISOR**

Prof. J. A. van der Poll

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(+27) 012 429 6230

University of South Africa  
(UNISA)

#### **STUDY INFORMATION**

Title of Research: Developing a framework to assist organisations with Information Technology adoption governance.

##### **Objectives:**

- (a) To understand how organisations make decisions on IT adoption
- (b) To find out how stakeholders are identified during IT adoption in organisations
- (c) To understand how stakeholders are involved in IT adoption decision making
- (d) To find out how stakeholders conflicts on IT adoption are resolved in organisations
- (e) To develop and test an improved framework to assist with IT adoption decision making in organisations

Nature: The proposed IT adoption framework is expected to assist organisations in resolving problem situations from multiple perspectives.

Implications: The proposed framework provides mechanisms for addressing conflict of interest among stakeholders, which is rather common with IT adoption in organisations. Responses will be confidential and anonymous.

Duration of Study: Until August 2014 (Date of submission)

#### **PERMISSION TO COLLECT DATA FOR RESEARCH**

I am a student at the University of South Africa, currently undertaking a PhD research study in Information Systems. As part of the degree requirements, I need to carry out research. I am writing to request your permission to collect data from employees in your organisation. In

order to obtain the relevant information in this study, I will adopt a mixed methods research approach.

I will collect data using questionnaires and semi-structured interviews with some selected participants from your organisation. For accurate data collection, I will audio-tape the interview proceedings. The plan is to collect data in the period from May 2013 till September 2014. The data so collected and the identity of the participants will be treated with confidentiality. The identities of the participants will be concealed, in any presentation and publication emerging from this research, by use of pseudonyms. The link to their real names will only be accessed by the researcher and the supervisor as well as the co-supervisor. If, however, for any reason, the participants would like their real names to be used in any future presentation, they will need to make written requests to me, as the researcher. There are no known or anticipated risks to the participants who will participate in this study.

Once the research has been completed, a brief summary of the findings will be available to the participants on request. The findings of the study will also be presented in academic conferences and published in national and international academic Journals. The participation of your organisation in this research project is completely voluntary. Should your organisation wish to withdraw at any stage, or withdraw any unprocessed data that will have been supplied, it will be free to do so without prejudice. The decision to participate or not, or to withdraw, will be completely independent of your organisational dealings with the University of South Africa.

I therefore request your permission to conduct research on the selected participants. I have enclosed a copy of participant consent form for your perusal. Should you have any questions or concerns regarding this letter or my research, please contact me at the address given above. You may also contact my supervisor or the co-supervisor on their email addresses given above.

Sincerely,

---

**O. Jokonya**  
**PhD Candidate**

---

**Date**

## **APPENDIX E: CASE STUDY PROTOCOL**

### **OBJECTIVES OF THE RESEARCH**

The main objectives of the study are to develop and validate a framework to assist organisations with IT adoption governance. The developed framework is expected to assist organisation with IT adoption decision making. The study will use sequential explanatory mixed methods approach. The first quantitative phase based on questionnaire will assist to cover more participants on the research phenomenon. The results from the quantitative phase will be used to develop the interview protocol for the qualitative phase. The qualitative phase will involve unstructured interviews with participants to obtain their perceptions on inconclusive results from the quantitative phase. The mixed methods approach is expected to offer more depth and breadth on the phenomenon than a single approach.

#### **1. Key issues on which the researcher needs to focus:-**

- To develop an IT adoption governance framework to assist organisations in decision making.
- To validate the developed IT adoption governance framework in two organisations that volunteered to participate in the study.

#### **2. FIELD PROCEDURES**

- At least twelve participants should be interviewed 6 from each of the two participating organisation. The six participants from the organisation will be from different department wherever possible. This triangulation is for purposes for data validation by data source.
- The participants should also include senior managers from the organisations
- Access to the information should be obtained wherever possible by introduction through a trusted (gatekeeper) intermediary
- Initial contact with the organisation should be at the highest level possible
- A friendly gatekeeper or guide should be found as soon as possible
- Interviews should be tape recorded with participants' consent
- Documentary evidence should be sought to support the verbal information wherever possible
- An attempt should be made to secure multiple interviews per visit so as to reduce travelling time
- Attempt to interview participants in their office rather than in an interview room
- Engage as many staff members as possible in general conversation about IT adoption decision making in organisations.

#### **3. CASE STUDY QUESTIONS**

The fundamental objective of the study is to develop and validate a framework to assist organisations with IT adoption governance. The following research questions were addressed:

- What are the participants' perceptions on the developed IT adoption governance framework from their organisational experience?
- How do participants differ on different constructs and variable of the developed IT adoption governance framework?
- Why if any are the reasons for the participants to differ on some constructs of the

developed IT adoption governance framework?

- What could be the reason for the difference in perceptions of participants on the constructs of the developed IT adoption governance framework?
- What are the implications of the findings on the developed IT adoption governance framework to organisations?

#### **4. CASE STUDY REPORT GUIDELINE**

The following are the major headings that were established as the key focal points of the case study report. These were established from the literature chapter so that they could be used as supplementary aids for the researcher in conducting unstructured interviews with the participants.

- Demographic variable showing characteristics and profile of the participants in the study.
- The TAM variables to assist with individual perception on IT adoption issues
- The IT governance variable to assist with aligning IT to business objectives
- Stakeholder participation variable to with identifying stakeholders of IT adoption
- Sociological paradigm to assist guidelines for understand IT adoption context
- Hard systems variable to assist with understanding participant perception on deterministic approach during IT adoption in organisations
- Soft systems variable to assist in understanding participants views on subjective issues during IT adoption in organisations
- Emancipatory variable to assist understand participants views on coercive issues during IT adoption in organisations.
- Critical systems variable to assist with understand participants views on complex issues during IT adoption in organisations.

#### **5. FIELD PROCEDURE**

- At least three participants should be interviewed from end user, management and IT staff. This triangulation is for purposes of data validation by data source.
- At least one participant should be a senior manager of the organisation
- Access to the information should be obtained wherever possible by introduction through a trusted (gatekeeper) intermediary
- Initial contact with the organisation should be at the highest level possible
- A friendly gatekeeper or guide should be found as soon as possible
- Interviews should be tape recorded with participants' consent
- Documentary evidence should be sought to support the verbal information wherever possible
- An attempt should be made to secure multiple interviews per visit so as to reduce travelling time
- Attempt to interview participants in their office rather than in an interview room
- Engage as many staff members as possible in general conversation about the software migration



## **APPENDIX F: INTERVIEW TRANSCRIPT SAMPLE**

### **Participant 1 (Accounts Clerk) – Tape 1 17/08/2013**

When an organisation is adopting a new system I would like to see proper training of users and training manuals. During the training one is not able to absorb everything and training manuals will be of assistance to the users. Training is important for users to familiarize with the new system which will be different from old system. Practical training and experimenting will give users the necessary exposure to the new system. In addition users need also to be told the benefits, limitations and new functions of the new system. At times organisations purchase a new system and spend more time without knowing most of the new system capabilities. Training will therefore be important to help users understand the new system capabilities and functions. It is important for the users to know the benefits of the new system in comparison to the old system to have their buy-in to the adoption process.

Security is also an area of major concern when adopting a new system in an organisation since users do not want a system that can be compromised. Security can be achieved by setting password to automatically expire after certain number of days. An audit trail is also important to show who did what to the system as part of security. Backup should also be easy to do and automated as part of safeguarding data from loss in case of a disaster. The system should have controls to allow separation of duties of users in terms of tasks done by junior and senior staff in the organisation. If one person does everything in the organisation it will compromise controls in the organisation.

IT committees are important in IT adoption because they help evaluate the new system in terms of meeting organisation objectives and needs. The IT committees assess what the system can do and cannot do and provide an overview to executive and other interested parties. I think IT committees should comprise representative members of different departments in the organisation. The representatives will assist in briefing other members in their departments about the benefits of the new system to get their buy-in. Users from departments can trust and listen to members from their department rather than other committee members from other departments. One prophet once said “If we do not listen to the youth of today, there will be a revolution, we need to involve the youth if there is a problem in government so that they talk to their fellow youth who can listen to them.” This is the same with users in the department, who will be more willing to listen to information coming from members of their department rather than strangers. There will be more acceptance of IT adoption if users in departments feel involved. Top-down approach to IT adoption will result in resistance and lack of buy-in to the process. “The expected beneficiaries will have a negative attitude towards the new system if they feel not involved.”

The users need to know the benefits of the new system to remove the negative attitude towards the new system. Although change is very difficult, it will be easier for the users to accept the new system if the benefits are clear to them. Support is also a very important element when adopting a new system, specifically from the system service provider. When there are problems with the new system the service providers need to resolve them timeously without affecting organisation productivity.

Yes, there is always politics which influence IT adoption in organisations. It is important to put organisation interest first rather than individual interest. Without seeing direct benefits from the new system some stakeholders may reject the system. Stakeholders need to know the benefit associated with the new system from individual, departmental and organisational perspective. If the benefits are not clearly communicated there will be negative attitude to the new system.

## APPENDIX G: SAMPLE INTERVIEW MATRIX ANALYSIS

	Interview Matrix Analysis				Date of Analysis								
	Inventory of concepts and informants												
	Use rows for concepts and columns for informants												
	Key Issues/Sources Matrix												
		1	2	3	4	5	6	7	8	9	10	11	12
		P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
1	TRNIN	x	x	x		x	x		x		x	x	x
2	COMM		x		x		x	x		x	x		
3	BENEF	x		x		x		x			x	x	x
4	INVOV		x		x		x		x	x		x	
5	EXPERI	x		x		x		x			x		x
6	FUNC	x			x	x				x	x	x	
7	SECUR	x	x	x		x	x		x				
8	ITCOM		x		x	x		x		x	x	x	x
9	REPRE	x	x	x		x				x			
10	NEEDS	x		x	x	x		x	x		x	x	x
11	TRUST		x	x		x	x		x	x			
12	ATTIT	x				x		x		x	x	x	x
13	BUYN	x		x	x		x			x	x		
14	LISTEN	x		x	x		x		x			x	x
15	BCKP			x	x	x		x	x		x		x
16	CONTR	x		x	x		x		x		x	x	
17	ATTIT	x	x		x	x		x			x		x
18	SUPP	x		x	x		x		x		x		
19	INTER	x	x	x	x			x		x		x	x
20	POLI		x	x	x	x	x		x		x		

## APPENDIX H: PARTICIPANT CONSET FORM

Dear Participant

Thank you for showing interest to participate in this study, which has the objective of expanding existing knowledge related to IT adoption decision making in organisations. The study is conducted by Osden Jokonya under the supervision of Prof Jan Kroeze from the University of South Africa. Your participation is completely voluntary and the results will be treated as both confidential and anonymous, and will only be used for research purposes. The duration of your participation is not expected to exceed one hour.

Declaration

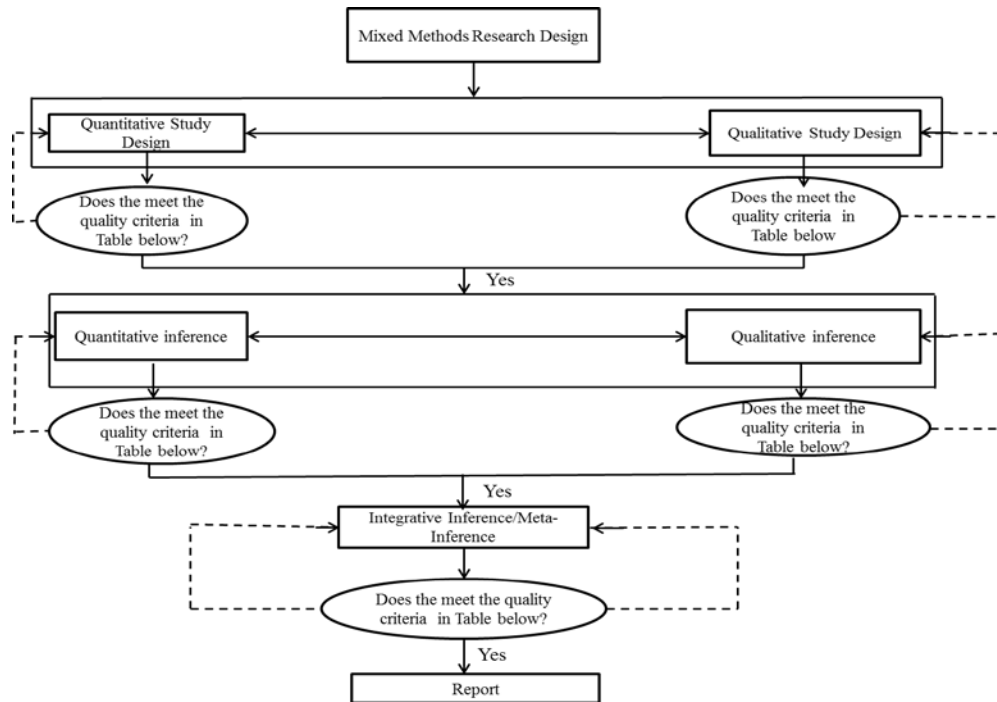
I, ..... hereby voluntarily grant my permission for participation in the research project as explained to me by the researcher Osden Jokonya. The inputs derived from my participation will be interpreted and presented in a confidential and anonymous manner. The nature, objective, possible safety and health implications have been explained to me and I understand them. I understand my right to choose whether to participate in the project and that the information furnished will be handled confidentially and anonymously. I am aware that the results of the investigation may be used for the purposes of publication. Upon signing of this form, you will be provided with a copy. The participant also has the right to withdraw their participation at any time.

Date .....

Participant

Researcher: Osden Jokonya

## APPENDIX I: AN INTEGRATIVE FRAMEWORK



Integrative Framework for Mixed Methods Inference Quality		
Quality Aspects	Quality Criteria	Description
<b>Design quality:</b> The degree to which a researcher has selected the most appropriate procedures for answering the research questions (Teddle and Tashakkori 2009).	Design suitability/appropriateness	The degree to which methods selected and research design employed are appropriate for answering the research question. For example, researchers need to select appropriate quantitative (e.g., survey) and qualitative (e.g., interview) methodologies and decide whether they will conduct parallel or sequential mixed methods research.
	Design adequacy	<b>Quantitative:</b> The degree to which the design components for the quantitative part (e.g., sampling, measures, data collection procedures) are implemented with acceptable quality and rigor. Indicators of inference quality include reliability and internal validity (Shadish et al. 2002; Teddlie and Tashakkori 2009). <b>Qualitative:</b> The degree to which the qualitative design components are implemented with acceptable quality and rigor. Indicators of inference quality include credibility and dependability (Teddle and Tashakkori 2009).
	Analytic adequacy	<b>Quantitative:</b> The degree to which the quantitative data analysis procedures/strategies are appropriate and adequate to provide plausible answers to the research questions. An indicator of inference quality is statistical conclusion validity (Shadish et al. 2002).
		<b>Qualitative:</b> The degree to which qualitative data analysis procedures/strategies are appropriate and adequate to provide plausible answers to the research questions. Indicators of quality include theoretical validity and plausibility.
<b>Explanation quality:</b> The degree to which credible interpretations have been made on the basis of obtained results (Lincoln and Guba 2000; Tashakkori and Teddlie 2003b).	Quantitative inferences	The degree to which interpretations from the quantitative analysis closely follow the relevant findings, consistent with theory and the state of knowledge in the field, and are generalizable. Indicators of quality include internal validity, statistical conclusion validity, and external validity.
	Qualitative inferences	The degree to which interpretations from the qualitative analysis closely follow the relevant findings, consistent with theory and the state of knowledge in the field, and are transferable. Indicators of quality include credibility, confirmability, and transferability.
	Integrative inference/meta-inference	<b>Integrative efficacy:</b> The degree to which inferences made in each strand of a mixed methods research inquiry are effectively integrated into a theoretically consistent meta-inference.
		<b>Inference transferability:</b> The degree to which meta-inferences from mixed methods research are generalizable or transferable to other contexts or settings. <b>Integrative correspondence:</b> The degree to which meta-inferences from mixed methods research satisfy the initial purpose (see Table 1) for using a mixed methods approach.

Source: Adapted from Venkatesh et al. 2013

## APPENDIX J: ANALYSIS OF VARIANCE

### Multiple Comparisons

Tukey HSD

Dependent Variable	(I) A5-Education level of respondent	(J) A5-Education level of respondent	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
B TAM total score	Matric	First Degree	-.1132	.148	.726	-.4667	.2404
		Second Degree	-.2026	.171	.464	-.6097	.2045
	First Degree	Matric	.1132	.148	.726	-.2404	.4667
		Second Degree	-8.944E-02	.176	.868	-.5095	.3306
	Second Degree	Matric	.2026	.171	.464	-.2045	.6097
		First Degree	8.944E-02	.176	.868	-.3306	.5095
C IT governance total score	Matric	First Degree	.2701	.165	.236	-.1233	.6635
		Second Degree	.5045*	.190	.025	5.154E-02	.9574
	First Degree	Matric	-.2701	.165	.236	-.6635	.1233
		Second Degree	.2344	.196	.459	-.2330	.7017
	Second Degree	Matric	-.5045*	.190	.025	-.9574	-5.154E-02
		First Degree	-.2344	.196	.459	-.7017	.2330
D Stakeholder participation total score	Matric	First Degree	.3977*	.140	.016	6.297E-02	.7324
		Second Degree	2.544E-02	.162	.986	-.3599	.4108
	First Degree	Matric	-.3977*	.140	.016	-.7324	-6.297E-02
		Second Degree	-.3722	.167	.071	-.7699	2.541E-02
	Second Degree	Matric	-2.544E-02	.162	.986	-.4108	.3599
		First Degree	.3722	.167	.071	-2.541E-02	.7699
E Sociological paradigm total score	Matric	First Degree	9.996E-02	.124	.701	-.1959	.3958
		Second Degree	-.2591	.143	.171	-.5997	8.158E-02
	First Degree	Matric	-9.996E-02	.124	.701	-.3958	.1959
		Second Degree	-.3590*	.147	.044	-.7105	-7.545E-03
	Second Degree	Matric	.2591	.143	.171	-8.158E-02	.5997
		First Degree	.3590*	.147	.044	7.545E-03	.7105
F Hard systems thinking	Matric	First Degree	.3193	.146	.080	-2.922E-02	.6678
		Second Degree	.2576	.168	.282	-.1437	.6588
	First Degree	Matric	-.3193	.146	.080	-.6678	2.922E-02
		Second Degree	-6.172E-02	.174	.933	-.4757	.3523
	Second Degree	Matric	-.2576	.168	.282	-.6588	.1437
		First Degree	6.172E-02	.174	.933	-.3523	.4757
G Soft systems thinking	Matric	First Degree	.1130	.135	.680	-.2084	.4344
		Second Degree	-.1076	.155	.768	-.4777	.2624
	First Degree	Matric	-.1130	.135	.680	-.4344	.2084
		Second Degree	-.2206	.160	.357	-.6025	.1612
	Second Degree	Matric	.1076	.155	.768	-.2624	.4777
		First Degree	.2206	.160	.357	-.1612	.6025
H Emancipatory systems thinking	Matric	First Degree	8.984E-02	.130	.769	-.2200	.3997
		Second Degree	-7.222E-02	.150	.880	-.4290	.2846
	First Degree	Matric	-8.984E-02	.130	.769	-.3997	.2200
		Second Degree	-.1621	.154	.548	-.5302	.2061
	Second Degree	Matric	7.222E-02	.150	.880	-.2846	.4290
		First Degree	.1621	.154	.548	-.2061	.5302
I Critical systems thinking	Matric	First Degree	4.918E-02	.143	.937	-.2925	.3908
		Second Degree	-.2689	.165	.238	-.6623	.1244
	First Degree	Matric	-4.918E-02	.143	.937	-.3908	.2925
		Second Degree	-.3181	.170	.154	-.7240	8.777E-02
	Second Degree	Matric	.2689	.165	.238	-.1244	.6623
		First Degree	.3181	.170	.154	-8.777E-02	.7240

\*. The mean difference is significant at the .05 level.

## APPENDIX K: STEPWISE REGRESSION ANALYSIS

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.560 <sup>a</sup>	.314	.306	.5901	.314	40.225	1	88	.000
2	.636 <sup>b</sup>	.404	.390	.5531	.090	13.185	1	87	.000
3	.657 <sup>c</sup>	.432	.412	.5432	.028	4.202	1	86	.043

a. Predictors: (Constant), D Stakeholder participation total score

b. Predictors: (Constant), D Stakeholder participation total score, F Hard systems thinking

c. Predictors: (Constant), D Stakeholder participation total score, F Hard systems thinking, G Soft systems thinking

**ANOVA<sup>d</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.009	1	14.009	40.225	.000 <sup>a</sup>
	Residual	30.647	88	.348		
	Total	44.656	89			
2	Regression	18.043	2	9.021	29.490	.000 <sup>b</sup>
	Residual	26.614	87	.306		
	Total	44.656	89			
3	Regression	19.282	3	6.427	21.785	.000 <sup>c</sup>
	Residual	25.374	86	.295		
	Total	44.656	89			

a. Predictors: (Constant), D Stakeholder participation total score

b. Predictors: (Constant), D Stakeholder participation total score, F Hard systems thinking

c. Predictors: (Constant), D Stakeholder participation total score, F Hard systems thinking, G Soft systems thinking

d. Dependent Variable: C IT governance total score

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.749	.363		2.065	.042
	D Stakeholder participation total score	.653	.103	.560	6.342	.000
2	(Constant)	.127	.381		.334	.739
	D Stakeholder participation total score	.447	.112	.384	4.001	.000
	F Hard systems thinking	.398	.110	.348	3.631	.000
3	(Constant)	.646	.451		1.431	.156
	D Stakeholder participation total score	.527	.117	.453	4.526	.000
	F Hard systems thinking	.431	.109	.378	3.962	.000
	G Soft systems thinking	-.237	.116	-.188	-2.050	.043

a. Dependent Variable: C IT governance total score

### Excluded Variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	B TAM total score	-.191 <sup>a</sup>	-2.192	.031	-.229	.985
	E Sociological paradigm total score	-.048 <sup>a</sup>	-.490	.625	-.052	.813
	F Hard systems thinking	.348 <sup>a</sup>	3.631	.000	.363	.744
	G Soft systems thinking	-.134 <sup>a</sup>	-1.365	.176	-.145	.802
	H Emancipatory systems thinking	-.069 <sup>a</sup>	-.702	.485	-.075	.817
	I Critical systems thinking	-.047 <sup>a</sup>	-.480	.633	-.051	.824
2	B TAM total score	-.142 <sup>b</sup>	-1.697	.093	-.180	.955
	E Sociological paradigm total score	-.121 <sup>b</sup>	-1.299	.198	-.139	.779
	G Soft systems thinking	-.188 <sup>b</sup>	-2.050	.043	-.216	.785
	H Emancipatory systems thinking	-.147 <sup>b</sup>	-1.582	.117	-.168	.779
	I Critical systems thinking	-.123 <sup>b</sup>	-1.324	.189	-.141	.787
3	B TAM total score	-.143 <sup>c</sup>	-1.743	.085	-.186	.955
	E Sociological paradigm total score	-.025 <sup>c</sup>	-.228	.820	-.025	.544
	H Emancipatory systems thinking	-.050 <sup>c</sup>	-.426	.671	-.046	.485
	I Critical systems thinking	-.027 <sup>c</sup>	-.245	.807	-.027	.545

a. Predictors in the Model: (Constant), D Stakeholder participation total score

b. Predictors in the Model: (Constant), D Stakeholder participation total score, F Hard systems thinking

c. Predictors in the Model: (Constant), D Stakeholder participation total score, F Hard systems thinking, G Soft systems thinking

d. Dependent Variable: C IT governance total score